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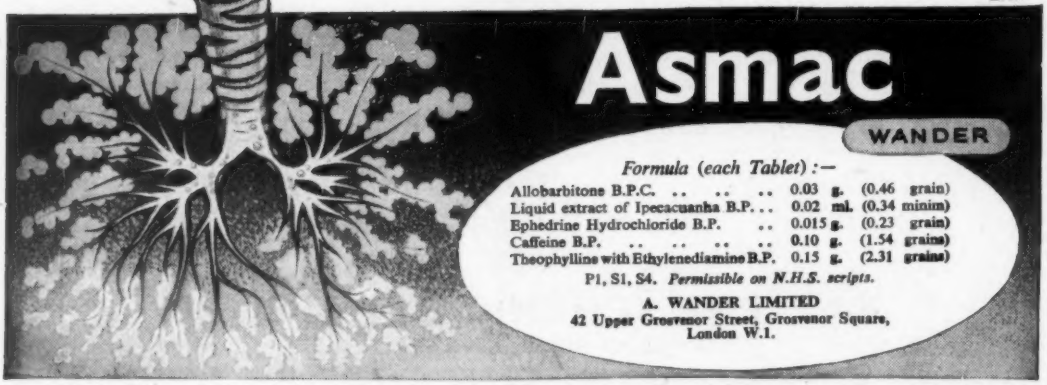

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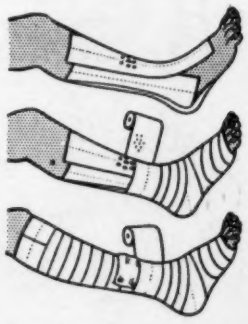

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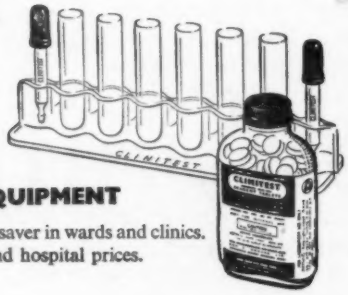

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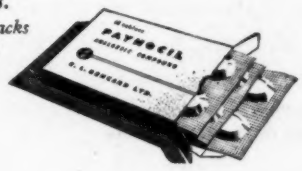

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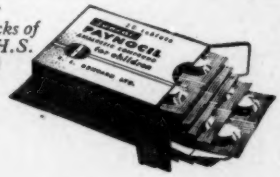

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Kwells brand — Hyoscine Hydrobromide · *Containers 10 x 0.3 mgm tablets Price 1/6*

Professional samples available on request to the manufacturers

E. GRIFFITHS HUGHES LIMITED, MANCHESTER

A new technique for topical application of antibiotics...

Providing a unique and economical means of applying the three antibiotics of choice for topical use, Zinc Bacitracin, Neomycin Sulphate and Polymyxin B. Sulphate. An extensive range of bactericidal activity is afforded without risk of inducing resistant strains of organisms. The Polybactrin unit is most useful IN ALL BRANCHES OF SURGERY and may be used on any broken tissue surface as a prophylactic or treatment.

POLYBACTRIN

antibiotic powder spray

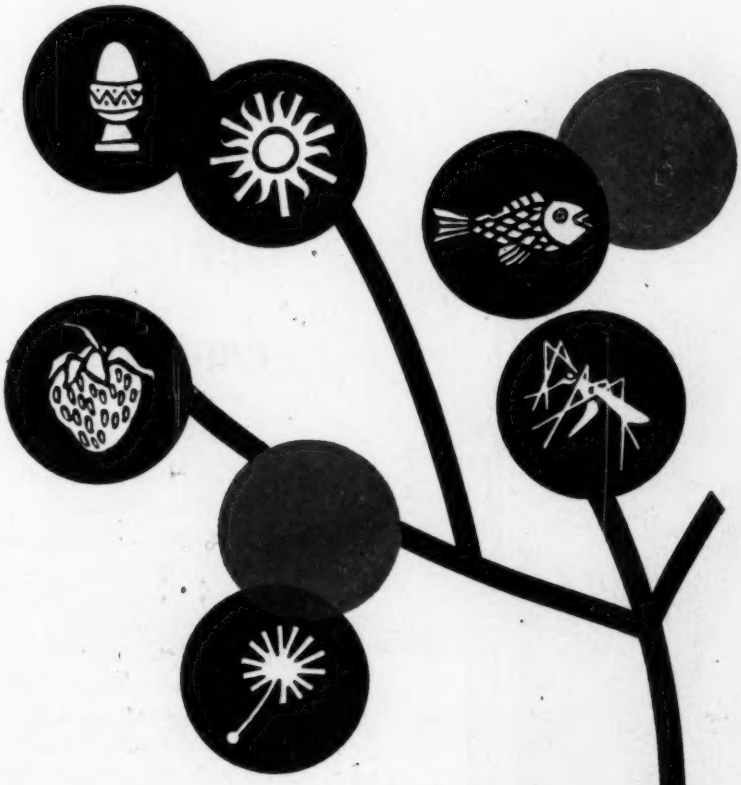
Formula:	Each pack contains:
Neomycin Sulphate	750 mg.
Polymyxin 'B' Sulphate	150,000 units.
Zinc Bacitracin	37,500 units.
Propellant	83.5 g.

Contents 85g. (approx)

CALMIC LIMITED CREWE. Phone CREWE 3251-5 **LONDON:** 2 Mansfield St., W.1. Phone LANgham 8038-9

AUSTRALIA: 458-468 Wattle Street, Ultimo, Sydney, N.S.W. **CANADA:** Terminal Building, York St., Toronto.

P2



For Allergies ALLERCUR

Highly effective Antihistamine

No side reactions · No symptoms of tiredness

Forms of application: Syrup · Dragees · Ampoules · Ointment

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everything under control?

To the manifold problems of weight reduction, REVICAPS REducing VItamin CAPSules offer a complete and well-reasoned answer. Their methylcellulose content furnishes essential bulk and their d-amphetamine sulphate suppresses appetite and elevates the mood. The result is a more contented, more co-operative patient who is far more likely to follow a reducing diet. REVICAPS also provide adequate amounts of vitamins and minerals to furnish those factors often lacking in a restricted diet. Yes—for the overweight patient on REVICAPS, it can truly be said that 'everything *is* under control'!

REVICAPS*

* Regd. Trademark

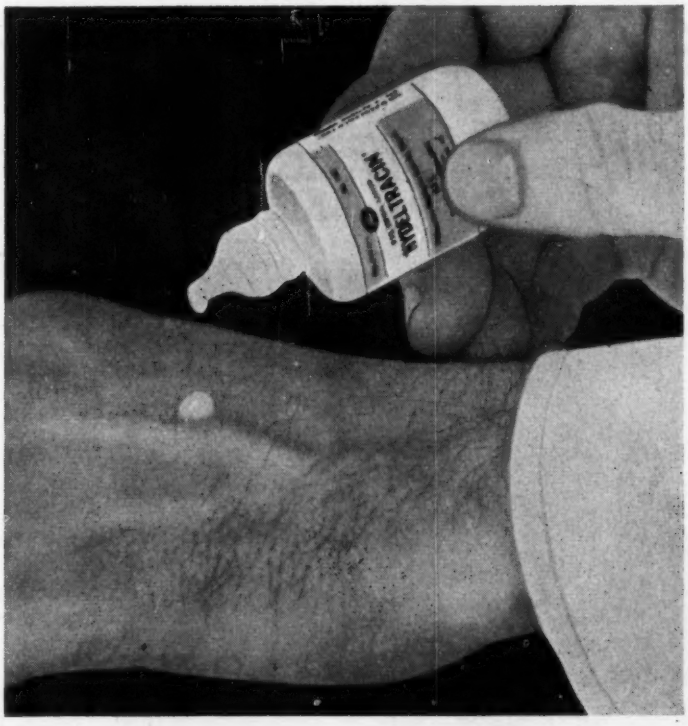
REducing VItamin CAPSules, Bottles of 100

Formula: Each capsule contains:		Methylcellulose	200 mg.
d-Amphetamine sulphate	5 mg.	Iron ($FeSO_4$ exsiccated)	3.34 mg.
Vitamin A	1,670 I.U.	Calcium ($CaHPO_4$)	140 mg.
Vitamin D	167 I.U.	Phosphorus ($CaHPO_4$)	108 mg.
Thiamine Mononitrate	1.0 mg.	Iodine (KI)	0.5 mg.
Riboflavine (B_2)	1.0 mg.	Fluorine (CaF_2)	0.1 mg.
Niacinamide	20.0 mg.	Copper (CuO)	1.0 mg.
Calcium pantothenate	0.34 mg.	Potassium (K_2SO_4)	5.0 mg.
Pyridoxine HCl (B_6)	0.34 mg.	Manganese (MnO_2)	1.0 mg.
Folic Acid	0.34 mg.	Zinc (ZnO)	0.5 mg.
Vitamin B_{12}	0.34 mcgm.	Magnesium (MgO)	1.0 mg.
Ascorbic acid (C)	20.0 mg.	Boron ($Na_2B_4O_7$)	0.1 mg.

LEDERLE LABORATORIES DIVISION

Lederle

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2



One drop spreads multiple benefits

INFLAMMATION WITH INFECTION DEMANDS

'HYDELTRACIN'

TRADE MARK

WHEN A SKIN LOTION IS PREFERRED

Prednisolone, when applied to skin lesions, exerts anti-inflammatory, anti-allergic and anti-pruritic actions similar to hydrocortisone—but concentrations only one-fifth to one-half that of the parent steroid are required. 'Hydeltracin' Topical Lotion contains 0.5 per cent of prednisolone together with 0.5 per cent of neomycin sulphate. The inclusion of neomycin ensures effective attack on most pathogenic organisms commonly found in skin lesions, and is necessary when prednisolone is used locally in the presence of infection. 'Hydeltracin' is indicated in skin lesions characterised by inflammation, with or without infection, such as: seborrhoeic dermatitis, contact dermatitis, adult eczema, infantile eczema, pruritus with lichenification, otitis externa, intertrigo.

NEW Topical Lotion—Prednisolone with Neomycin

How supplied: *'Hydeltracin' Topical Lotion is formulated in an elegant, non-greasy base, and packed in plastic squeeze-bottles containing 15 ml.*

MSD MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS.

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed.* Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins. It is now being widely prescribed with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

**Therapeutische Umschau VIII*, 1952, 10, 143

Transvasin is available in 1 oz. tubes, basic N.H.S. price in the U.K. 2/6 plus P.T., and is not advertised to the public. It may be prescribed on Form E.C.10. Samples and literature will gladly be sent on application.

LLOYD-HAMOL LTD., 11 WATERLOO PLACE, LONDON, S.W.1. WHITEHALL 8654/5/6

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An inspired association

Kemicetine succinate

Streptomycin dihydrostrept.

The high solubility of **Kemicetine Succinate** in water has made it possible to manufacture a preparation associating chloramphenicol with streptomycin, which can be administered parenterally. In Strepto-Kemicetine, the two antibiotics exert a most valuable complementary effect as well as one of simultaneous potentiation, thus producing extremely good results, particularly in pertussis, brucellosis, staphylococcal infections, tubercular empyema and infections of the urinary system.

STREPTO-KEMICETINE

The first injectable association of chloramphenicol and streptomycin.

CARLO ERBA MILANO

CARLO ERBA MILANO

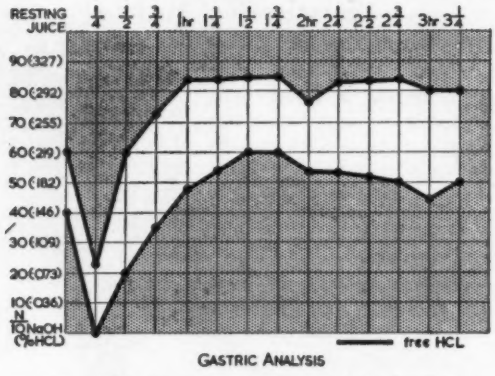
17

"an approach to the ideal is provided by a slowly dissolving antacid tablet which is lodged between the gum and cheek. Thus, with each act of swallowing, alkali is carried down over the gullet to the stomach. It is remarkable how little is the quantity needed to depress effectively the concentration (pH) of gastric HCl. The first such tablet ('nulacin')...."

Practitioner, January, 1957.

NULACIN THERAPY

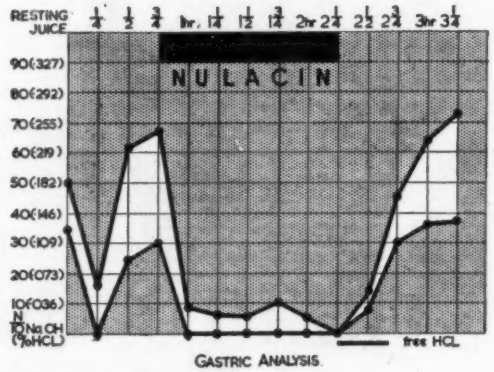
—Simple, safe, effective



GASTRIC ANALYSIS

A Nulacin tablet effectively depresses the concentration of gastric HCl in peptic ulcer and other conditions of hyperacidity. It also provides protection against gastric HCl to the otherwise unprotected oesophageal wall and in such conditions as oesophagitis and hiatus hernia.

SUPPLY. Nulacin tablets may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Basic price to N.H.S.: 2/-). Also available in tubes of 12.



GASTRIC ANALYSIS

HORLICKS LIMITED *Pharmaceutical Division, Slough, Bucks., England*

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Wind in the grass . . .

. . . and pollen in the air bring discomfort to thousands at this time of year. For Hay Fever sufferers Pabracort Insufflations have proved their value by clinical trial and in general practice. Dramatic relief is usually obtained within two or three days and complete alleviation after two weeks' treatment.

Each insufflation capsule contains 15 mg. hydrocortisone acetate in a specially prepared snuff base (micronized).

Reference: Lancet (1956) i., 537.

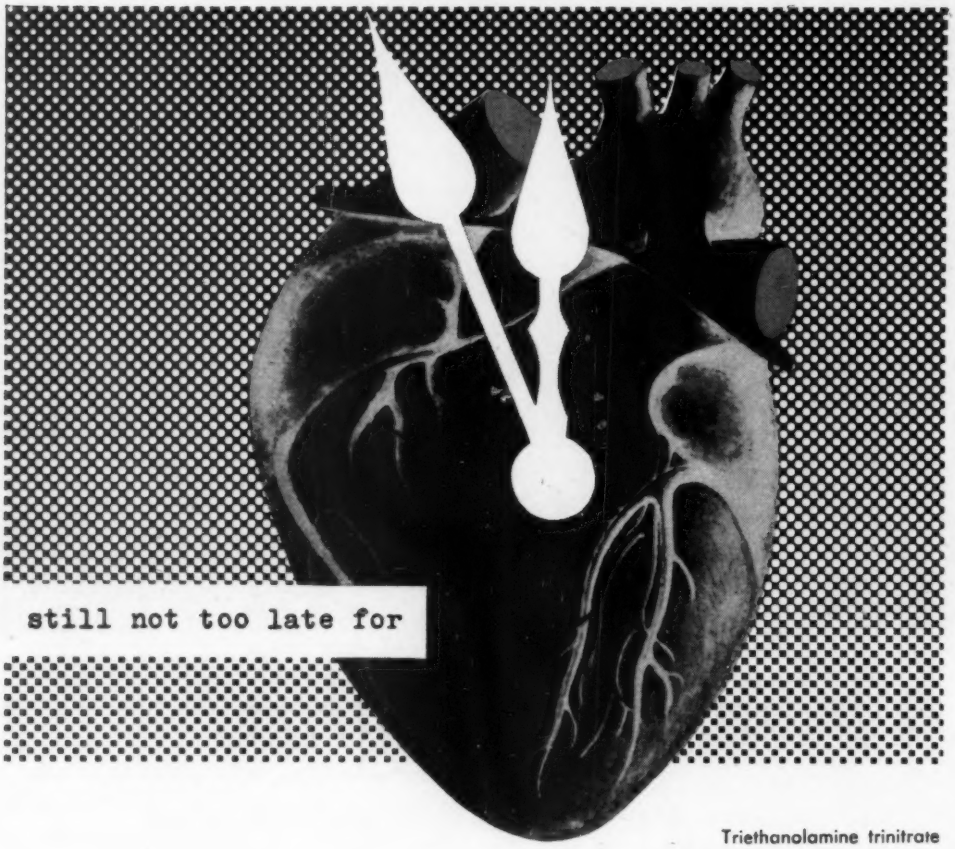
PABRACORT

INSUFFLATIONS

Packings: Pabracort outfit (10 capsules and insufflator)
Capsules 10, 25, 100.

PAINES AND BYRNE LTD., PABYRN LABORATORIES, GREENFORD, MIDDX

Angina pectoris



Triethanolamine trinitrate

PRAENITRONA

Prevents attacks of angina pectoris or at least reduces the severity and frequency of attacks

For maintenance treatment, 1 – 2 tablets 3 or 4 times a day
Packings: 50 · 500 · 1000 tablets, each of 1 mg.

Praenitrona is prescribable on N. H. S. Form E. C. 10

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ACHROMYCIN* V

TETRACYCLINE BUFFERED WITH SODIUM METAPHOSPHATE

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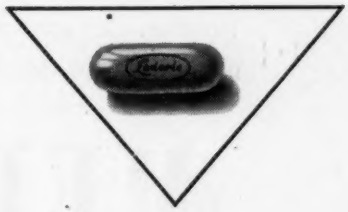
makes the therapy more secure

ACHROMYCIN V is an improved, oral form of ACHROMYCIN tetracycline—already recognised as today's foremost self-sufficient broad spectrum antibiotic. ACHROMYCIN V combines ACHROMYCIN tetracycline with sodium metaphosphate to provide more rapid absorption of tetracycline and higher levels of the antibiotic in the blood. This is achieved without any increase in the daily dosage of the antibiotic.

ACHROMYCIN V is presented in oral capsules containing 250 mg. ACHROMYCIN tetracycline and 380 mg. Sodium Metaphosphate.

Bottles of 16, 100 and 1000 Capsules



RECOMMENDED DOSAGE : As for ACHROMYCIN 1 Gm. daily for the average adult

CYANAMID 50 1907 1957

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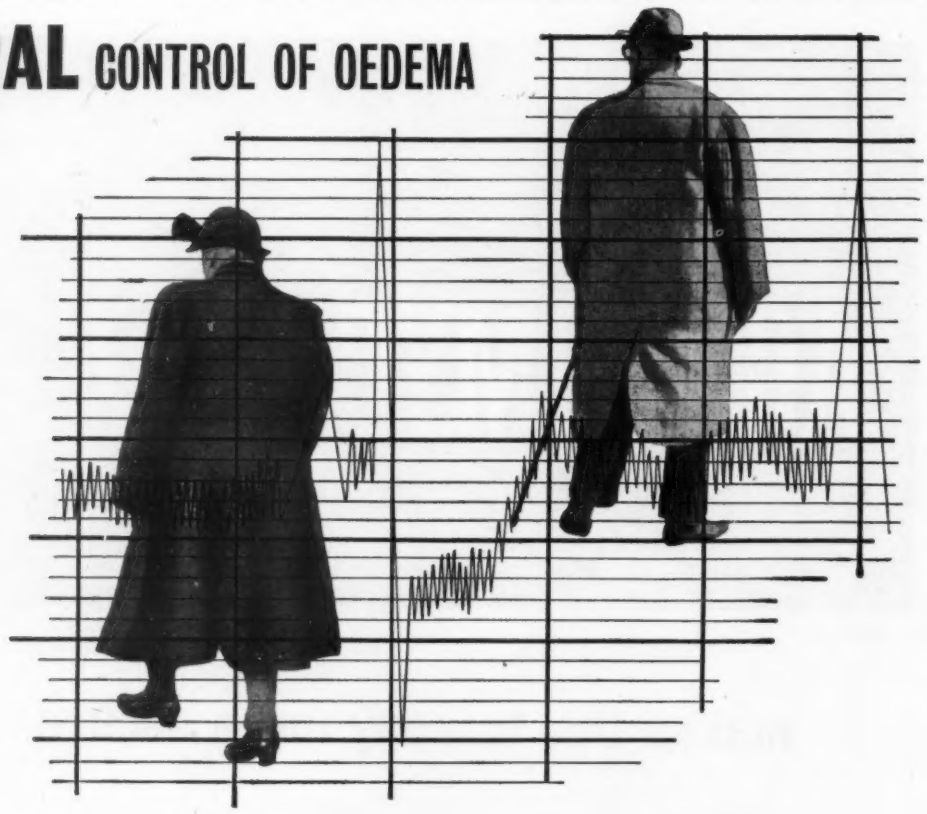
ORAL CONTROL OF OEDEMA



Oedema in cardiac patients can now be successfully controlled by Mercloran, a mercurial diuretic which is effective when given orally. Two to three Mercloran Emplets daily maintain a smooth oedema-free state and eliminate the see-saw effect of preparations given intermittently. Mercloran in most cases completely eliminates the need for injection. However, in the acute case where it is deemed necessary to initiate treatment parenterally, the chemically related compound, Mercardan, is available.

MERCLORAN

(CHLORMERODRIN N.N.R.)

EMPLETS: (enteric coated tablets)
In bottles of 25 and 250

AND MERCARDAN FOR PARENTERAL USE

PARKE, DAVIS & Company, Limited *(Inc. U.S.A.)* **Hounslow, Middlesex · Tel. Hounslow 2361**

571

"All right Mr. Baxter, shall we continue? . . .

. . . now that you seem to be getting the idea, just let me reiterate that I.Z.S., as you so neatly put it, 'has something the other insulins haven't got.' In other words, in about 90 per cent. of patients the blood-sugar level can be controlled for up to 24 hours with a single injection of I.Z.S.

When you compare the various insulins available, you'll find that no other form is so universal in its application as I.Z.S. This is, among other things, because I.Z.S. does not contain any protein or peptide material other than the insulin itself, and is therefore practically free of any allergic reactions. Perhaps Mr. Baxter will now give others a chance to raise their questions."

I.Z.S. A.B. Vials of 10 c.c.
40 or 80 units per c.c.

I.Z.S. (Amorphous) A.B.
Vials of 10 c.c. 40 units per c.c.

I.Z.S. (Crystalline) A.B.
Vials of 10 c.c. 40 units per c.c.

Insulin Zinc Suspension A.B.

A|B TRADE MARK

Joint Licensees and Manufacturers:

ALLEN & HANBURYS LTD LONDON E2 • THE BRITISH DRUG HOUSES LTD LONDON N1

A New Pack of Floraquin

25 Tablets with Applicator

facilitates treatment of vaginitis by restoring pH

Following the success of the applicator introduced with the 50 Floraquin pack a year ago, a new pack of 25 tablets including an applicator has now been made available to take the place of the original 24 tablet pack which is now discontinued.

This new pack of 25 tablets with applicator is available at the price formerly charged for the 24 tablet pack.

Literature on request.

"FLORAQUIN" is a Registered Trade Mark.

FL: P77

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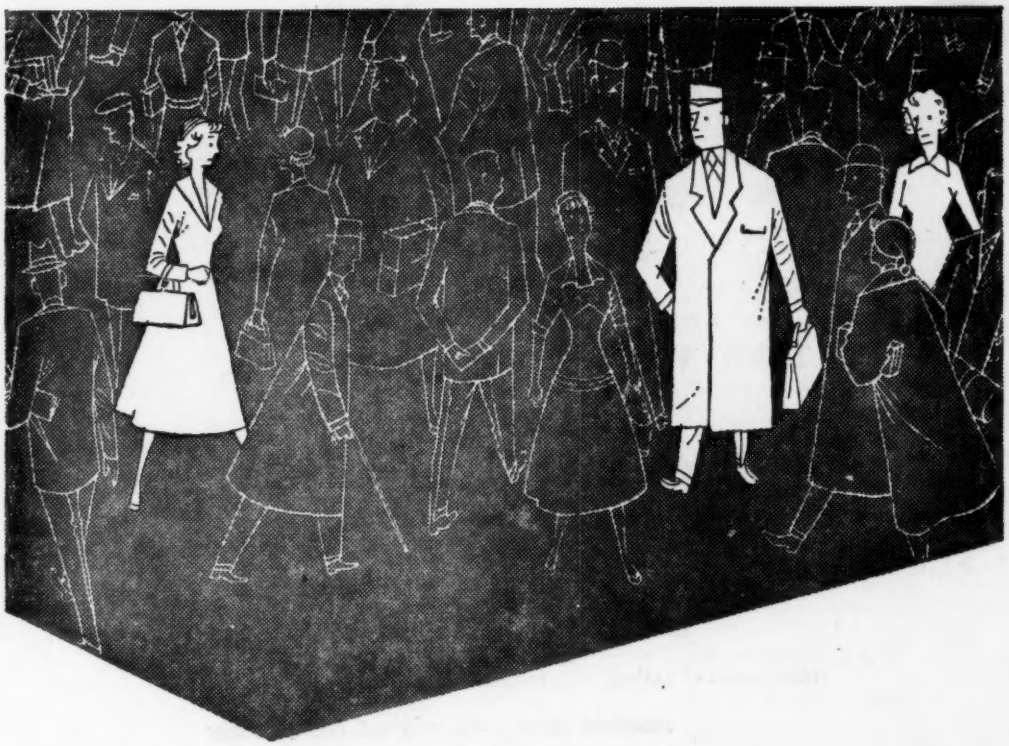
G. D. SEARLE & CO. LTD.
HIGH WYCOMBE, BUCKS HIGH WYCOMBE 1770



Take any crowd: in it you are certain to find some who are hypersensitive to substances regarded as inoffensive by most of us. But discomfort and distress are not inevitable results of exposure to offending allergens.

Whenever symptoms of allergy or sensitization limit the patients activities, treatment with one of the M&B brand antihistaminics is indicated for prompt symptomatic relief.

'ANTHISAN'
trade mark brand
MEPYRAMINE MALEATE
THE GENERAL-PURPOSE ANTIHISTAMINIC

'PHENERGAN'
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PROMETHAZINE HYDROCHLORIDE
THE ANTIHISTAMINIC WITH A PROLONGED ACTION

'ANTHISAN' 50 and 100 mgm. tablets • Elixir (25 mgm. per 3·6 c.c., approx. 1 teaspoonful) • 2·5% solution for injection.

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CALCIUM-**PENICILLIN V**

the most efficient

oral penicillin

Calcipen-V is the calcium salt of **Penicillin V** and offers the following advantages in oral penicillin therapy·

rapid onset of action **reliable absorption**

sustained blood levels on 4 to 6 hourly dosage

Calcipen-V

Tablets of 60 mg. **Penicillin V** (as calcium salt). Bottles of 20, 100, 500.
Tablets of 120 mg. **Penicillin V** (as calcium salt). Bottles of 20, 100, 500.

Detailed literature will be gladly sent on request

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all you need for corticosteroid treatment

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(cortisone Glaxo)
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Intramuscular Injection
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(prednisone Glaxo)

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Eye Ointment*
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Skin Ointments
(non-greasy and greasy)*
Intravenous Injection
Tablets
**Also available with neomycin*

DELTA-CORTELAN
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Available in 2 potencies
1 mg. 5 mg.
Indicated for patients requiring long-term systemic corticosteroid treatment at high dosage

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For reliable oral therapy

'Penavlon' V

Penicillin V tablets

'PENAVLON' V is the I.C.I. trade name for penicillin V, now rapidly becoming established in the field of oral penicillin therapy.

This acid stable form of penicillin is rapidly and efficiently absorbed, giving consistent and reliable blood levels. In these respects it is superior to other oral penicillin preparations, and may be relied upon to replace treatment by injection in a large number of cases.

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Ph. 724 IMPERIAL CHEMICAL INDUSTRIES LIMITED Pharmaceuticals Division Wilmslow Cheshire

THIS SUMMER TREAT FUNGAL INFECTIONS WITH TEOQUIL

The introduction of Teoquil, a new synthetic anti-fungal substance of low toxicity, marks a decided advance in the treatment of fungal infections of the skin.

Teoquil, in low concentrations, possesses a high degree of activity against mycelial fungi and some activity against yeast-like forms. It has also antibacterial properties which are particularly marked against Gram-positive organisms, including *Staphylococcus aureus*, *Staphylococcus albus* and *Streptococcus hæmolyticus*.

Teoquil is available in two forms—Teoquil Gel and Teoquil Dusting Powder. Teoquil Gel does not stain the skin or clothing. It may be used alone or in conjunction with the Dusting Powder in the treatment of fungal infections of the skin including Athlete's foot and tinea infections in other parts of the body.

TEOQUIL
TRADE MARK

Teoquil Gel is supplied in bottles containing 28 c.c., with brush.

Teoquil Dusting Powder is supplied in polythene 'puffer' bottles containing 25 grammes.

C57/309-10/H

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TELEPHONE: BISHOPSGATE 3201 (12 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON".

KOLANTYL

for more complete medical treatment of peptic ulcer

ANTISPASMODIC

To reduce ulcer pain and to delay stomach emptying, so assisting antacid action.

ANTACID

To neutralise excess acid. The antacid component of 'Kolantyl' is virtually ideal; rapid and prolonged in action, neither laxating nor constipating.

ANTILYSOZYME

To inhibit excess lysozyme, which is believed to be a factor in the aetiology of peptic ulcer.

DEMULCENT

To ensure ingredients adhere to mucosal surfaces and to assist in protecting the ulcer crater.

"... may be safely tried out under G.P. conditions with every prospect of a good result ..."
Medical World (1955) 82: 379

Formula

Each tablet or 10 c.c. of Gel contains :

'Merbentyl' (diethylaminocarbethoxybicyclohexyl hydrochloride)	5 mg.
Dried Aluminium Hydroxide Gel	400 mg.
Heavy Magnesium Oxide	200 mg.
Sodium Lauryl Sulphate	25 mg.
Methylcellulose	100 mg.

Gel

Bottles of 12 fl. oz.

Tablets

Cartons of 48 and 240 tablets in roll packs of 12.

Dosage

1 to 2 tablets (2 to 4 teaspoonfuls of Gel) 3 or 4 times a day.

Merrell Research

'Kolantyl' and 'Merbentyl' are registered trade marks of the Wm. S. Merrell Co.

Distributed in Great Britain and Republic of Ireland by
RIKER LABORATORIES LTD.
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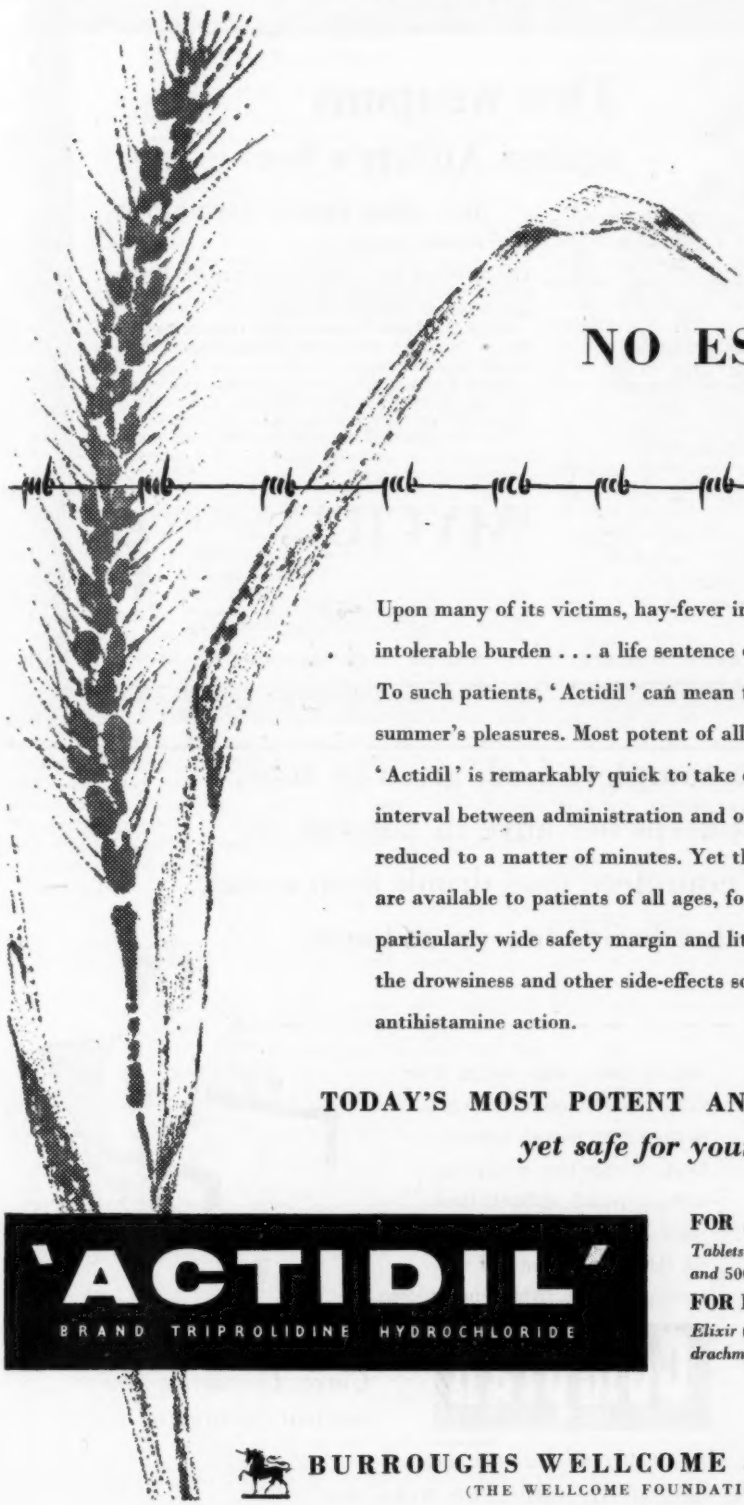

NO ESCAPE?

Upon many of its victims, hay-fever imposes an almost intolerable burden . . . a life sentence of disrupted summers. To such patients, 'Actidil' can mean the rediscovery of summer's pleasures. Most potent of all antihistamines, 'Actidil' is remarkably quick to take effect. Indeed, the interval between administration and onset of relief has been reduced to a matter of minutes. Yet these exceptional benefits are available to patients of all ages, for 'Actidil' has a particularly wide safety margin and little tendency to evoke the drowsiness and other side-effects so often associated with antihistamine action.

TODAY'S MOST POTENT ANTIHISTAMINE
yet safe for your youngest patient

'ACTIDIL'
BRAND TRIPROLIDINE HYDROCHLORIDE

FOR ADULTS
Tablets (2·5 mgm.) : Bottles of 25, 100 *and* 500
FOR INFANTS AND CHILDREN
Elixir (1 mgm. 'Actidil' per fluid drachm) : Bottles of 20 fl. oz.

BURROUGHS WELLCOME & CO., LONDON
(THE WELLCOME FOUNDATION LTD.)

Two weapons
against Athlete's Foot
and other fungal dermatoses

The combined use of Mycil Ointment and Powder has proved to be highly effective in both prophylaxis and treatment of fungal dermatoses.

Mycil Ointment is formulated to ensure penetration of the active constituent, chlorphenesin, to the site of the infection.

Mycil Powder, used alone, prevents reinfection. Because of its adsorptive properties it is useful in combating the effects of excessive perspiration.

Both preparations are non-mercurial and odourless and may be used over long periods, if necessary, without adverse effects.

'MYCIL' TRADE MARK

MYCIL OINTMENT in collapsible metal tubes 1/6
MYCIL POWDER in sprinkler tins 1/6
Basic N.H.S. prices *(Purchase Tax extra)*

'MYCIL' Pessaries are available for treatment of trichomonal and fungal infections of the vagina.

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.1

The **complete** food, given by tube,
that keeps her alive in hospital . . .
is the **complete** food drunk from a cup,
that builds her up at home.

Among those who benefit from Complan are those who do not or cannot eat enough normal food, or when they need extra—such as invalids, sufferers from peptic ulcers and allied complaints, the elderly, expectant and nursing mothers, babies and children.

Complan *Trade mark*

In 1 lb. cartons and 14 lb. tins.

The complete food by Glaxo. Containing every nutrient essential to life.

GLAXO LABORATORIES LTD, GREENFORD, MIDDLESEX, BYRon 3434
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HYPERTONIA OR UNEVENTFUL HIGH BLOOD PRESSURE *

WILLIAM EVANS
M.D., D.Sc. Lond., F.R.C.P.
PHYSICIAN TO THE CARDIAC DEPARTMENT OF THE LONDON HOSPITAL, TO THE NATIONAL HEART HOSPITAL, AND TO THE INSTITUTE OF CARDIOLOGY; CONSULTING CARDIOLOGIST TO THE ROYAL NAVY

IN no other division of medicine is opinion more confused than in that which deals with the cause and significance of a high blood pressure, and with the progress and treatment of any patient who may exhibit it. On the one hand, the condition is known to maim suddenly, and even to kill unexpectedly, someone customarily enjoying vigorous health. On the other hand, a substantially raised blood pressure may sometimes be watched through many years in a subject who, although troubled at times with a variety of complaints may attain longevity, and eventually succumb to some other illness.

It is this uncertainty that imparts a sense of urgency to the problem to discover why a raised blood pressure is serious in one patient and relatively innocent in another. The nomenclature of hypertension tends to hinder this differentiation, and both its classification and terminology may be in need of revision. It is known for instance that the *non-renal hyperpiesia* of Allbutt may show terminal renal involvement. Again, the term *benign* is ill-suited to a condition that can suddenly jeopardise vision, precipitate an alarming attack of cardiac asthma from left ventricular failure, or cause coma from cerebral infarction. Terms like *primary* or *essential* also, can hardly apply to a state where a cause is operating even though for a time it may remain obscure. Moreover, so-called *malignant hypertension* is scarcely a disease entity and may prove to be a form of arterial hypertension, more abrupt in its onset and more rapid in its progress than the kind more commonly met with, for papillœdema is not infrequently added in the later stages of arterial hypertension.

Having regard to the perplexity of the problems which arise from the finding of a raised blood pressure, and which concern definition, ætiology, and prognosis, it is the purpose of this paper to deal with two groups of patients which are sharply differentiated into those with, and those without, cardio-arterial derangement. Such differentiation was made by reference to the findings of a clinical, cardioscopic, and especially to an electrocardiographic examination.

* The substance of an address given during the Harveian Tercentenary meetings held in London in June, 1957.

The Investigation

The blood pressure was first recorded in 400 consecutive healthy male recruits entering military service. The behaviour of the blood pressure was then watched in 200 cases over a period of some ten years, and these were in four groups. The first consisted of 50 healthy male recruits in whom the blood pressure was accepted as normal; the second was made up of 50 male recruits who had showed a somewhat raised blood pressure; the third group consisted of 50 older male and female patients examined consecutively in private practice and in whom the blood pressure was substantially raised in the absence of cardio-arterial derangement; the fourth group held 50 patients with proved arterial hypertension examined alongside patients in the previous group. Care was taken to exclude patients with coarctation, endocrine, toxæmic, and nephritic, hypertension.

In each case admitted into the series, in addition to a routine clinical examination, particular attention was paid to retinoscopy which was carried out in all where the blood pressure was raised to a value above the accepted normal. During this test, apart from the search for papillœdema, areas of exudate and hæmorrhage, attention was specially directed to discovering arteriolar contraction. A comprehensive electrocardiogram was recorded in all the adult patients and in every young subject if the blood pressure was raised, while cardioscopy was a routine test in all, when the left ventricle was specially examined for enlargement in both anterior and left oblique views. Ancillary tests were added whenever necessary.

The examination was conducted in a calm atmosphere and in a quiet consulting room when patient and observer had been in the company of each other for some twenty minutes before the blood pressure was recorded in the semi-recumbent position and in accordance with the recommendations issued by the Committee for Stan-

TABLE I—BLOOD PRESSURE IN 400 HEALTHY MALE RECRUITS ENTERING MILITARY SERVICE

Age (yr.)	No. of cases	Systolic blood pressure* (mm. Hg.)										Diastolic blood pressure* (mm. Hg.)						
		Mean	Less than 140	140	145	150	155	160	165	170	More than 170	Mean	Less than 85	85	90	95	100	105
18	45	150	13	8	1	5	7	4	2	2	3	90	10	16	12	6	1	..
19	57	150	15	6	7	10	4	8	1	3	3	90	8	12	23	9	3	2
20	40	150	7	..	6	11	4	9	1	..	2	90	5	9	11	7	7	1
21	6	150	2	1	..	..	1	..	1	..	1	90	2	1	2	1	..	..
22	8	140	4	1	..	1	..	1	..	..	1	85	3	3	1	1	..	..
23	9	150	1	1	3	2	..	..	1	..	1	90	1	1	3	3	1	..
24	9	150	2	4	..	1	..	..	..	1	1	90	1	1	5	..	1	1
25	14	140	4	4	..	1	4	1	..	..	..	90	3	4	4	2	1	..
26	11	140	4	4	2	..	..	..	1	..	..	90	2	3	3	1	2	..
27	16	145	5	6	..	1	1	..	1	1	1	90	1	5	5	4	..	1
28	12	150	4	1	2	..	..	2	..	1	2	85	3	4	4	..	1	..
29	14	140	7	..	2	1	3	1	..	..	..	90	1	3	7	3	..	..
30	9	150	4	..	1	1	..	..	1	..	2	90	2	1	4	..	..	2
31	13	150	4	..	2	2	1	1	..	2	1	90	2	..	6	3	2	..
32	13	150	4	..	1	1	..	1	2	3	1	90	4	..	3	1	4	1
33	20	145	8	3	1	1	..	2	1	1	3	90	4	4	4	3	5	..
34	19	150	8	2	2	..	..	4	1	..	2	90	4	4	6	3	..	2
35	13	150	4	1	2	..	1	2	..	3	..	90	2	3	4	..	2	2
36	15	150	..	1	2	3	3	2	2	2	..	90	1	3	5	1	5	..
37	11	150	3	1	1	3	..	2	..	..	1	90	1	2	..	5	2	1
38	19	140	9	..	3	1	3	1	..	..	2	90	4	4	6	5	..	..
39	14	145	5	3	..	1	2	1	1	1	..	90	2	3	7	1	1	..
40	13	155	4	1	..	..	..	2	1	3	2	90	1	4	3	5	..	..
Total	400	..	121	48	38	46	34	44	17	23	29	..	67	90	128	64	38	13

* Lowest of three readings.

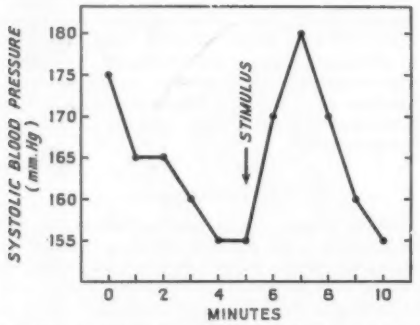

Fig. 1—Subsidence of blood pressure value following rest and its rise following emotional disturbance in the form of casual explanation of amyl nitrite inhalation (indicated by arrow).

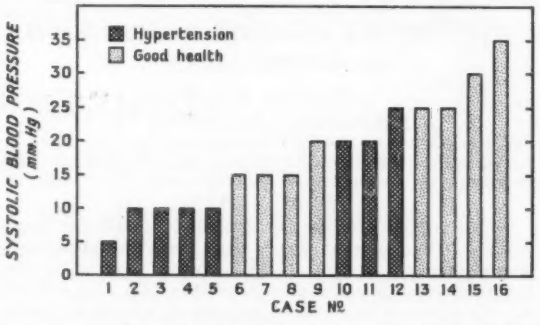

Fig. 2—Rise in systolic blood pressure in 8 healthy subjects and in 8 patients with hypertension following simple explanation of how to inhale a capsule of amyl nitrite.

dardisation of Blood Pressure. The lowest of three readings was accepted as the basal value.

The number of healthy subjects and of patients assembled for this clinical inquiry is not large. Indeed, it was kept small by design and in the belief that greater reliance could be placed on information gained from observation of a limited number of cases, than from a statistical review of large numbers not under one's personal supervision.

Blood Pressure in Healthy Young Subjects

The blood pressure was first recorded in 400 consecutive male recruits submitting themselves for military service, where a routine clinical examination had found no abnormal physical signs, where cardioscopy had shown the heart to be natural both in shape and in size, and where the electrocardiogram whenever taken had proved the absence of left ventricular preponderance.

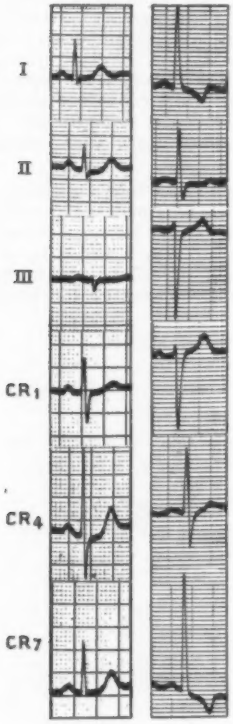

Fig. 3—The electrocardiogram (A) from a patient with hypertonia, is within normal limits, and that in (B) from a patient with arterial hypertension shows left ventricular preponderance.

The basal systolic blood pressure was found to be 160 mm. Hg. or over in 113, 165 or over in 69, and 170 or over in 52 instances. The mean was 150 mm. Hg. The pressure was no higher in those belonging to the fourth than the third age decade. In only 121 of the 400 recruits was the systolic pressure lower than 140 mm. Hg.

The basal diastolic blood pressure was 90 mm. Hg. or over in 243, 95 or over in 115, 100 or over in 51, and 105 in 13 instances. The mean was 90 mm. Hg. In only two age-groups was the mean diastolic pressure lower than 90 mm. Hg. (table I).

The influence of emotional disturbance on the systolic blood pressure, and to a lesser extent on the diastolic pressure, is known to be real, and it often explains the relatively high values obtained from the casual examination of both young and older healthy subjects. Thus, the gradual subsidence of a high reading during a period of mental calm induced by quiet physical rest was demonstrated repeatedly (fig. 1), while its abrupt rise following a trivial excitatory stimulus was equally a common experience, and taking place without any apparent loss of poise on the part of the patient (figs. 1 and 2). This constant fluctuation of the sphygmomanometric reading, confirming the natural mutability of the blood pressure value, emphasises how unreliable is the blood pressure by itself as evidence of hypertension.

For the purpose of this paper cases which showed a raised blood pressure in the absence of cardio-arterial changes, eventually confirmed by the absence of left ventricular preponderance in the electrocardiogram (fig. 3A), are referred to as instances of *hypertonia*, to distinguish them from patients with arterial hypertension where cardio-arterial changes included left ventricular preponderance (fig. 3B).

Consideration of Moderate Hypertonia as a Prehypertensive State

Most will readily concede that a slightly raised blood pressure in youthful subjects in no way interferes with the health or the physical performance of the individual at the time. Thus, to find this moderate rise in blood pressure in military recruits destined to engage in strenuous exercise for a limited number of years did not breed any anxiety lest they should fail to perform their peculiar tasks efficiently, or that any exacerbation of the blood pressure might thereby ensue. The question in most need of a decisive answer is whether a moderately raised blood pressure in a young subject, admittedly insignificant at the time, is destined to become a state of hypertension in adult life. It is not until this inference is refuted with emphasis that insurance companies will accept as physiological or innocent, the finding of a slightly raised blood pressure met with in applicants for life assurance benefits, and which is inseparable from the natural anxiety and excitement peculiar to this special medical examination. A similar medical test is also a prerequisite condition before admission to a post of trust carrying superannuation benefits, so that a decision on the significance of a raised blood pressure in this context is also a matter of great moment.

As a contribution to the better understanding of this aspect of hypertension, a number of the military recruits examined a decade or so before, were recalled. The individuals invited to attend this examination were in two groups, in the one the blood pressure reading had been accepted as being of normal value at the first attendance, and in the other the systolic pressure was 180 mm. Hg. or over, and/or the diastolic pressure was

100 or over. The blood pressure readings at this second attendance will now be considered for each group.

Blood Pressure in Young Adults some Ten Years Later

Male recruits for military service who had been found healthy following clinical, cardioscopic, and sometimes electrocardiographic examination, were invited to re-attend. The invitation was issued in alphabetical order to these healthy recruits, who had in the meantime returned to civilian occupation after a term of military service, and the 50 reported here were the first to respond, so that the cases were never specially selected. The ages of the recruits at the primary examination varied from 17 to 48 years and the average age for the group was 23 years. The period since the first examination averaged ten years.

In that the systolic blood pressure was less than 180 mm. Hg., and the diastolic less than 100 mm. in the first instance, these readings had been accepted as residing within normal limits. The blood pressure value at the second examination exceeded slightly that obtained at the first in eight instances; in 28 the reading was about the same; in 14 cases the second reading was a little lower than the first. The average blood pressure for the whole group was 145/85 at the first examination and 140/80 at the second. Neither collectively, nor individually, did the blood pressure show a constant tendency to increase as the subjects aged; indeed, the reverse was true (table II).

TABLE II—BLOOD PRESSURE IN 100 HEALTHY RECRUITS AFTER AN INTERVAL OF ABOUT TEN YEARS. AT THE FIRST EXAMINATION 50 HAD SHOWN A NORMAL BLOOD PRESSURE AND 50 A SLIGHTLY RAISED BLOOD PRESSURE

	Normal blood pressure					Moderate hypertonia			
	First examination		Second examination			First examination		Second examination	
Case no.	Age (yr.)	Blood pressure (mm. Hg.)	Blood pressure (mm. Hg.)	Interval between examination (yr.)	Case no.	Age (yr.)	Blood pressure (mm. Hg.)	Blood pressure (mm. Hg.)	Interval between examination (yr.)
1	38	135/85	180/110	13	51	40	155/100	205/130	13
2	19	110/70	140/70	15	52	35	135/100	180/105	14
3	18	135/85	140/90	7	53	43	160/105	200/100	11
4	34	125/85	145/90	15	54	33	140/100	160/110	14
5	48	135/90	150/95	12	55	34	160/100	165/110	14
6	33	125/75	140/80	14	56	32	145/100	150/100	13
7	19	135/85	145/100	15	57	37	145/100	150/95	14
8	21	120/80	140/85	12	58	22	140/100	140/100	13
9	41	155/95	165/90	13	59	31	190/100	125/95	12
10	18	135/85	135/80	8	60	18	180/115	175/100	8
11	21	140/90	140/90	15	61	18	180/100	155/85	5
12	37	165/90	160/90	13	62	40	180/95	140/90	12
13	18	155/80	130/80	13	63	18	185/95	140/80	6
14	18	150/90	150/90	8	64	18	145/105	115/75	6
15	17	140/85	140/80	9	65	18	170/100	150/70	12
16	27	135/80	120/80	15	66	44	180/105	155/90	14
17	17	155/85	150/80	11	67	36	155/105	120/80	5
18	18	140/95	140/90	9	68	18	170/110	145/90	6
19	18	115/70	115/70	9	69	17	150/105	125/85	6
20	18	120/85	120/75	6	70	18	200/95	150/90	5
21	17	120/80	130/85	9	71	17	135/105	130/90	13
22	18	135/80	130/70	6	72	28	145/100	120/80	14
23	20	145/85	140/80	15	73	17	160/105	140/70	6
24	18	150/85	150/80	6	74	43	160/100	150/90	11
25	18	150/80	140/80	7	75	17	180/100	130/70	7
26	18	125/70	130/70	10	76	19	180/100	150/70	14
27	29	155/85	130/65	14	77	18	170/105	140/80	7
28	32	145/85	130/85	13	78	17	170/100	135/80	12
29	18	130/90	135/85	10	79	18	180/115	175/100	8
30	18	130/85	135/90	7	80	18	170/100	150/80	6
31	28	175/90	160/90	15	81	18	145/100	130/75	13
32	17	140/80	135/80	13	82	18	110/100	115/75	5
33	17	155/80	145/85	11	83	35	140/100	120/85	14
34	18	130/70	145/70	9	84	21	180/80	160/75	6
35	18	135/85	140/80	10	85	18	170/100	150/85	7
36	41	155/95	150/80	13	86	18	170/100	145/90	6
37	17	160/95	140/80	12	87	18	170/105	150/95	14
38	21	165/90	140/70	10	88	31	170/100	155/90	12
39	19	140/85	130/80	10	89	17	150/105	125/90	9
40	35	145/85	135/75	14	90	27	145/110	145/90	13
41	18	150/85	130/80	5	91	20	150/100	140/80	14
42	19	155/95	135/85	15	92	40	180/95	150/85	14
43	18	155/85	125/60	15	93	18	175/105	130/85	6
44	28	150/90	140/80	10	94	18	165/100	140/85	12
45	33	140/85	135/80	14	95	20	150/100	120/80	6
46	18	145/90	140/80	14	96	18	160/100	150/80	7
47	18	145/90	120/85	6	97	24	140/100	120/80	10
48	18	165/85	130/80	6	98	38	180/90	125/70	14
49	25	135/85	130/70	13	99	43	165/110	145/95	8
50	32	130/85	125/75	12	100	18	170/100	130/85	10

Moderate Hypertonia in Young Adults some Ten Years Later

Fifty male recruits from among those in whom the systolic blood pressure was 180 mm. Hg. or over, and/or the diastolic pressure was 100 or over, were next asked to attend for re-examination according to the alphabetical order of their names. Their age at the first examination varied from 17 to 44 years, and the average age was 25 years. The average interval between their two visits was ten years. At both attendances each one on clinical and cardioscopic examination, had proved to be healthy, and none had shown evidence of cardio-arterial derangement. The only sign that singled them out for special attention, therefore, was the slightly raised blood pressure reading discovered at the first examination. Each had been accepted for military service and on routine discharge had entered civilian occupation and had remained free from symptoms.

The blood pressure at the second examination was estimated in like circumstances to the first, with the subject in the semi-recumbent position in a quiet room, when the lowest of three readings was accepted as the basic value. At this second test an electrocardiogram was recorded in every case in a search for the earliest trace of left ventricular enlargement. In assembling the 50 cases two had to be excluded from the series because one had aortic coarctation and the other early aortic incompetence, and in both instances the lesion had been overlooked at the first examination.

In only five was the blood pressure significantly higher at the second examination than at the first, and each of these, like the others, was symptom-free, and showed neither enlargement of the left ventricle on cardioscopy, left ventricular preponderance in the electrocardiogram, nor any evidence of renal disease. In three the blood pressure reading was about the same as at the first examination, while in the remaining 42 the second reading was lower. The average value for the whole group had been 160/100 at the first examination, and after ten years this figure had subsided to 145/85 (table II). As in the previous group, so also here, neither collectively nor individually, did the blood pressure show a constant tendency to increase with age; indeed, the reverse was true. Although nervousness and apprehension may have contributed to a high reading in some of the recruits at the first examination on account of a natural anxiety connected with it, the majority of them appeared outwardly calm, while the second examination was not free from anxiety in that the purpose of their recall was not known to them.

Hypertonia Contrasted with Arterial Hypertension

The progress of 50 older subjects with more obvious hypertonia was next observed over periods of seven to ten years, and compared with a like number of patients with arterial hypertension assembled during the same period. As in the case of the previous series, so here, the two groups were distinguished one from the other by the absence or presence of cardio-arterial derangement, ultimately determined by the absence or presence of left ventricular preponderance in the electrocardiogram. All patients were otherwise unselected and they were included in the series consecutively as they presented for examination. The sole qualification that admitted them for investigation was a systolic blood pressure of 200 mm. Hg. or over and/or a diastolic pressure of 110 or over.

The age of the hypertonia series was 40 to 78 years, and the mean was 61; the age of the hypertension series was 41 to 75 years, and the mean was 60.

TABLE III—LEADING SYMPTOMS IN 50 PATIENTS WITH ARTERIAL HYPERTENSION COMPARED WITH THOSE IN 50 CASES OF HYPERTONIA

Nature of symptom	Hypertension series	Hypertonia series
Incidental:		
Palpitation	1	5
Giddiness	0	3
Left mammary pain	0	3
Sleeplessness	0	3
Tiredness	0	2
Tinnitus	0	1
Of hypertensive origin:		
Cardiac asthma	7	0
Stroke	3	0
Visual disturbance	2	0
Hæmoptysis	1	0
Epistaxis	1	0
Of doubtful hypertensive origin:		
Encephalopathy	1	1
Cardiac pain	20	20
Dyspnœa	7	2
Claudication	1	0
Headache	3	6
None	3	4

In the hypertonia group there were 21 men and 29 women; in the hypertension group there were 34 men and 16 women. Thus, hypertonia was commoner among women, and hypertension among men.

SYMPTOMS

Since the patients in both groups were seen in private practice, only a few were free from symptoms, three in the hypertension and four in the hypertonia series. When symptoms were present, their character differed significantly in the two groups (see table III). Thus, in the hypertonia series 17 complained of functional or incidental symptoms which included palpitation, giddiness, left mammary pain, sleeplessness, tiredness, and tinnitus; one only had a symptom which could be related to the raised blood pressure, namely encephalopathy. In the hypertension series on the other hand, only one patient had functional symptoms, namely palpitation; another had encephalopathy. Fourteen suffered from symptoms which were the direct outcome of hypertensive disease and which included cardiac asthma, stroke, visual disturbance, hæmoptysis, and epistaxis.

Additionally, patients from both groups complained of symptoms which did not appear to be directly related to hypertension, like shortness of breath on exertion and not the result of heart failure, intermittent claudication, and headache. Cardiac pain was present in 20 patients from each group, and it was difficult to opine at the outset with certainty whether this was a fortuitous association, or whether being the result of coronary atheroma, it had been caused by the raised blood pressure. During the period when the 100 patients in the two series were assembled, 498 adult patients over the age of 40 years had been examined. Of these 282 had a normal blood pressure and no cardiac pain, 116 had cardiac pain and a normal blood pressure, 20 had cardiac pain and arterial hypertension, and 20 had cardiac pain with hypertonia. It was deduced from these findings that cardiac pain was a fortuitous association in the two series now under discussion.

CLINICAL AND CARDIOGRAPHIC SIGNS

An appraisal of the physical signs which differentiated hypertonia from hypertension is made easier when discussed under three separate heads. The first concerns the actual blood pressure value, the second deals with the innocent physiological effects of a raised blood pressure, and the third with those lasting and progressive pathological changes which are part of arterial hypertension.

The Blood Pressure

In the hypertonia group the systolic blood pressure varied between 175 and 280 mm. Hg., and the diastolic between 105 and 145; the mean blood pressure for the whole group was 220/120. In the arterial hypertension group the systolic blood pressure varied between 130 and 280 mm. Hg., and the diastolic pressure between 110 and 170; the mean blood pressure for the whole group was 215/125. Although the height of the blood pressure was impressive in the hypertonia series, the diastolic reading was usually higher in the hypertension group. Thus, a diastolic pressure of 130 or over was found 37 times in the hypertension series compared with 19 in the hypertonia series. Again, a diastolic pressure of 140 or over was found in only 5 of the hypertonia cases compared with 19 among the patients with hypertension. In regard to the systolic blood pressure, the mean was actually higher for the hypertonia series, but apart from emphasising the equally high values obtained for this innocent group it should not be held that the systolic readings are consistently higher than in arterial hypertension, because a systolic pressure of 230 mm. Hg. or over was found 13 times in the hypertonia series compared with 15 in the hypertension series. The actual blood pressure readings in individual patients are shown in tables IV and V.

It was not possible to obtain blood pressure readings in all the patients at regular intervals during the period covered by the investigation, but sporadic readings became available in the majority of them. Whenever this intermediate examination had been carried out the

TABLE IV—BLOOD PRESSURE, SYMPTOMS, AND PROGRESS OF 50 PATIENTS WITH ARTERIAL HYPERTENSION

Case no.	Sex	Present age or at death (yr.)	Leading symptom	Blood pressure (mm. Hg.)	State of health if alive	Manner of death if demised
1	M	65	Cardiac pain	210/140	Heart failure	..
2	M	70	Stroke	260/145	..	Stroke
3	M	64	Breathlessness	220/130	..	Cardiac infarction
4	F	74	Hæmoptysis	220/130	..	Cardiac infarction
5	M	54	Breathlessness	190/145	..	Heart failure
6	F	55	Headache	255/150	..	Uræmia
7	F	68	Cardiac pain	220/130	..	Cardiac infarction
8	M	69	None	200/135	..	Heart failure
9	M	46	None	215/135	..	Stroke
10	M	70	Cardiac pain	215/135	..	Heart failure
11	M	71	Cardiac pain	240/150	..	Stroke
12	M	47	Cardiac pain	240/140	..	Heart failure
13	M	55	Headache	205/130	..	Heart failure
14	M	60	Cardiac pain	205/135	..	Cardiac infarction
15	F	62	Encephalopathy	235/135	..	Pulmonary infarction
16	F	73	Faulty vision	220/120	Cardiac pain	..
17	M	63	Cardiac pain	185/125	..	Not known
18	M	61	Cardiac pain	180/130	..	Heart failure
19	F	64	Cardiac pain	200/135	..	Aortic rupture
20	M	71	Cardiac pain	200/140	..	Cardiac infarction
21	F	65	Faulty vision	235/140	..	Stroke
22	M	53	Cardiac pain	185/135	..	Cardiac infarction
23	M	68	Claudication	235/130	..	Stroke
24	M	42	Headache	235/160	..	Stroke
25	M	49	None	220/140	Stroke	..
26	M	65	Breathlessness	220/140	..	Stroke
27	M	60	Cardiac asthma	190/125	..	Heart failure
28	M	51	Cardiac pain	240/145	..	Cardiac infarction
29	F	56	Breathlessness	250/165	..	Cardiac infarction
30	M	48	Breathlessness	170/140	..	Suicide
31	M	71	Cardiac asthma	230/120	..	Heart failure
32	M	60	Cardiac pain	205/110	..	Cardiac infarction
33	M	77	Cardiac pain	200/115	Cardiac pain	..
34	M	82	Cardiac pain	200/130	Stroke	..
35	F	63	Epistaxis	180/130	..	Not known
36	M	62	Breathlessness	215/125	..	Heart failure
37	F	77	Palpitation	230/170	..	Heart failure
38	M	67	Cardiac pain	190/110	Heart failure	..
39	M	62	Stroke	170/110	..	Not known
40	M	54	Cardiac pain	220/140	..	Cardiac infarction
41	F	73	Cardiac pain	240/140	..	Cardiac infarction
42	F	69	Cardiac pain	205/145	..	Cardiac infarction
43	M	65	Cardiac pain	180/115	..	Stroke
44	F	64	Cardiac asthma	210/150	..	Car accident
45	F	80	Cardiac asthma	250/130	..	Stroke
46	F	77	Cardiac asthma	205/115	..	Cardiac infarction
47	M	69	Stroke	210/115	..	Stroke
48	F	60	Cardiac asthma	280/135	..	Stroke
49	M	67	Breathlessness	200/130	..	Carcinoma of lung
50	M	81	Cardiac asthma	130/115	..	Stroke

blood pressure remained consistently high, with a slight rise in the diastolic value, in the patients with arterial hypertension, while in the subjects with hypertonia the readings fluctuated and at times subsided temporarily to normal values. This mutability was a constant feature of this group which by itself helped to differentiate it from arterial hypertension where the readings remained stable except with the intrusion of cardiac infarction which sometimes partly subdued the systolic reading while the diastolic pressure remained almost immutable, retaining its substantially high value.

It was seldom possible to estimate satisfactorily how long a raised blood pressure had existed before the first examination. In the hypertonia series a history of it often pre-dated the admission to this investigation by some years. In the patients with arterial hypertension too, the absence of any kind of symptom until a significant episode directly attributable to the disease had taken place, suggested that the raised blood pressure had been present for some time. The question naturally arises as to whether the elevated blood pressure presides in a patient for a reasonable period before it gives rise to specific cardio-arterial changes instanced by left ventricular preponderance and arterial contraction. This contingency is likely, although this investigation has shown it to be rare, and in only four patients, outside this series, was a maintained high pressure in two and a normal blood-pressure in two, watched before the cardiogram showed left ventricular preponderance. It appears, therefore, that it is the persistence of the high blood pressure that determines the development of cardio-arterial changes in arterial hypertension, and that the mutability of the pressure in hypertonia preserves the subject from this material change in the size of the heart and the bore of the lesser arteries. This naturally breeds the question what determines the persistency of the high blood pressure value in arterial hypertension. It is likely that the cause resides within the arterial wall and depends on its facility to induce intimal proliferation which leads to arterial and arteriolar obstruction.

TABLE V—BLOOD PRESSURE, SYMPTOMS, AND PROGRESS OF 50 CASES WITH HYPERTONIA

Case no.	Sex	Present age or at death (yr.)	Leading symptom	Blood pressure (mm. Hg.)	State of health if alive	Manner of death if demised
1	F	78	Encephalopathy	225/115	Well	..
2	M	70	Sleeplessness	205/130	Well	..
3	M	69	Cardiac pain	220/130	Well	..
4	F	65	Cardiac pain	210/110	Cardiac pain	..
5	F	78	Cardiac pain	210/125	Cardiac pain	..
6	M	51	Sleeplessness	235/135	Well	..
7	M	67	Breathlessness	200/120	Well	..
8	F	67	Tiredness	230/115	..	Carcinoma of stomach
9	M	82	Cardiac pain	240/120	..	After prostatectomy
10	F	71	Giddiness	220/110	Well	..
11	M	70	Headache	210/110	Well	..
12	M	79	Cardiac pain	220/115	Cardiac pain	..
13	M	70	Cardiac pain	200/120	..	Cardiac infarction
14	F	69	Tinnitus	210/105	Better	..
15	M	57	Cardiac pain	200/130	Cardiac pain	..
16	M	61	Cardiac pain	210/120	..	Cardiac infarction
17	F	72	Headache	180/135	Cardiac pain	..
18	F	73	Cardiac pain	220/110	..	Cardiac infarction
19	M	71	Cardiac pain	215/125	..	Cardiac infarction
20	F	77	Cardiac pain	240/115	..	Cardiac infarction
21	F	53	Chest pain	210/140	Well	..
22	M	55	Cardiac pain	215/125	Well	..
23	F	69	Cardiac pain	220/135	Cardiac pain	..
24	F	58	Dizziness	255/145	Well	..
25	F	74	Palpitation	220/120	..	Car accident
26	F	73	None	235/115	Well	..
27	F	71	Sleeplessness	220/130	Well	..
28	F	58	Cardiac pain	210/130	Cardiac pain	..
29	F	69	Cardiac pain	250/135	..	Cardiac infarction
30	F	72	Headache	230/115	Well	..
31	F	79	Cardiac pain	200/115	..	Cardiac infarction
32	F	79	Palpitation	190/115	Well	..
33	F	65	Cardiac pain	210/115	..	Cardiac infarction
34	F	82	Headache	280/145	Well	..
35	M	65	Headache	195/135	Well	..
36	F	58	Headache	245/130	Well	..
37	F	82	Chest pain	210/130	Well	..
38	F	77	Palpitation	190/115	Well	..
39	M	64	Cardiac pain	190/115	Cardiac pain	..
40	M	72	Breathlessness	230/140	Well	..
41	M	68	None	220/110	Well	..
42	F	67	Palpitation	205/115	Well	..
43	M	59	Tiredness	175/115	Well	..
44	M	60	Cardiac pain	230/145	..	Cardiac infarction
45	M	53	Palpitation	200/105	Well	..
46	F	73	Giddiness	200/130	Well	..
47	M	80	None	200/115	Well	..
48	M	48	None	210/120	Well	..
49	F	59	Cardiac pain	260/130	Well	..
50	F	69	Chest pain	195/110	Well	..

Physiological Effects of a Raised Blood Pressure

Inseparable from a substantial rise in blood pressure is an increase in carotid pulsation, the sequence of a raised arch from aortic unfolding. Even the phenomenon of the kinked carotid may be present, though seldom in men.

The other innocent effects of a raised blood pressure, common to subjects with hypertonia as well as patients with arterial hypertension, are found on auscultation. They include a loud auricular sound and a sound in early systole; both signs give rise to the clinical impression of a splitting of the first sound and resort may have to be made to a phonocardiogram for a true interpretation. The mitral valve component of the first heart sound is loud in the mitral area, while a louder aortic second sound is found in both mitral and aortic areas.

The physical signs just enumerated under this head are, therefore, also unhelpful in the clinical diagnosis of hypertonia and hypertension.

Signs Peculiar to Arterial Hypertension

The clinical signs identified with arterial hypertension are sparse, and this inevitably leads to an unjustified reliance on the blood pressure reading alone.

A brachial artery that is easily felt is not an infrequent finding in healthy and even young subjects, so that it is never a pathognomonic sign of arterial hypertension. The present investigation, however, has emphasised that a clinical diagnosis of arterial hypertension could seldom be entertained unless in the presence of a narrowed and whipcord-like brachial artery.

The most reliable clinical sign comes to light from an examination of the retinal arterioles. The column of blood in the arteriole, some two-thirds the width of that in the adjoining vein, may be likened unto a *pink skein of wool*. When persistent hypertension has caused refractory arteriolar contraction this column narrows to less than half the width of the venous column. A moderate or severe degree of narrowing with corresponding pallor, gives the arteriolar blood column the appearance of either a *pale string* in the moderate phase, or a *white thread* in the severe phase. One or other of these changes was present in the patients with arterial hypertension, and were absent in the subjects with hypertonia.

The third clinical sign of arterial hypertension, namely a displaced or forcible apex beat, did not prove universally helpful in the differential diagnosis between the two groups. Thus, in the moderately lean patient with long established arterial hypertension the sign was present, but in the case of a thick chest wall, and moderate or less enlargement of the left ventricle, the sign was missing. Again, in a lean healthy subject with scoliosis, the apex beat may be both displaced and thrustful, especially in the presence of moderate tachycardia.

Cardioscopy often showed prominence of the aortic knuckle in both conditions, but enlargement of the left ventricle, present in patients with arterial hypertension,

except early in the illness, was always absent in the subjects with hypertonia.

Electrocardiography, above all else, proved decisive in distinguishing the ominous disease, arterial hypertension from the innocent state, hypertonia. In any case of doubt this test was the final arbiter, for in the former condition the tracing showed left ventricular preponderance and in hypertonia this was absent. The electrocardiogram, not infrequently, told of left ventricular hypertrophy before this showed as left ventricular enlargement at cardioscopy, and so proved a more useful test to apply in the differential diagnosis of the two conditions.

In the diagnosis of early left ventricular preponderance, care is needed to notice its early signs in the tracing in the form of plane depression of the S–T segment with a lowering of the T wave in lead CR_7. In the presence of cardiac pain, care is also needed in the interpretation of the electrocardiographic changes, for they may mean either left ventricular preponderance or cardiac infarction of lateral distribution; in both circumstances a like deformity of the S–T segment and the T wave may be found in leads I and CR_7. The presence of left ventricular preponderance is favoured, however, if these changes are greater in CR_7 than in I, if the R wave is tall in both leads, and if S–T depression is absent from IIIR (lead III during deep inspiration).

When complications had set in, naturally other signs made their appearance in arterial hypertension. Thus, with the onset of heart failure, triple rhythm due to addition of the third heart sound appeared on auscultation, and hilar congestion on cardioscopy. When conspicuous enlargement of the left ventricle had taken place a systolic murmur appeared in the mitral area, and sometimes an early diastolic murmur of relative aortic incompetence, as well as a splitting of both first and second heart sounds from left bundle branch block. Moreover, hæmorrhage and areas of exudate sometimes appeared in the retinæ, and even papillœdema late in the illness, while albuminuria and a raised blood urea told of renal involvement.

Favourable Prognosis in Hypertonia

When the progress of patients was watched over a period of nine to ten years, 38 out of 50 patients in the hypertonia group had survived compared with only six out of 50 in the hypertension group. Furthermore, not a single case of hypertonia had died from the effects of a raised blood pressure nor complained of any specific symptoms connected with it. The actual cause of death had been cardiac infarction in nine, accident in one, cancer in one, and another failed to survive the operation of prostatectomy. On the other hand, death in the 44 patients with arterial hypertension had resulted directly from the disease in 25, a stroke in 12, hypertensive heart failure in 10, uræmia in one, rupture of the aorta in one, and pulmonary infarction in one. In the remaining 19 patients, death had taken place from incidental causes, namely cardiac infarction in 13, accident in two, and cancer in one, while the manner of death in three others was not known although when last seen one had cardiac pain following cardiac infarction and two were suffering from the effects of a stroke.

Of the 38 survivors in the hypertonia group, 29 maintained that they were well although a few of them had trivial complaints; another reported improvement of his headache, while eight were subject to cardiac pain. This state of well-being in so many of the patients in this group is particularly significant when account is taken of their age, namely, an average of 66 years. Treatment had included sedative medicines on occasion, but firm reassurance and encouragement to lead a natural life had taken pride of place among any therapeutic measures dispensed to them; none was asked to take any hypotensive drug.

TABLE VI—CAUSES OF DEATH IN 44 OF 50 PATIENTS WITH ARTERIAL HYPERTENSION AND IN 12 OF 50 CASES OF HYPERTONIA

Cause of death	Hypertension series	Hypertonia series
Hypertensive effects:		
Stroke	12	0
Hypertensive heart failure	10	0
Uræmia	1	0
Rupture of aorta	1	0
Pulmonary infarction	1	0
Other effects:		
Cardiac infarction	13	9
Accident	2	1
Post-operative	0	1
Cancer	1	1
Unknown	3	0
Total	44	12
Alive	6	38

Of the six survivors in the hypertension group with an average age of 69 and observed during eight to nine years, two are precariously ill from hypertensive heart failure, two suffer from the effects of a stroke, and two have cardiac pain. The average survival period in 25 patients who had died of the effects of hypertension was two years and the average age at death was 60 years.

These findings, summarised in table VI, emphasise the innocence of hypertonia, and are in sharp contrast with those which endorse the serious prognosis identified with arterial hypertension as judged during an observation period of eight to ten years.

Summary

The blood pressure was first examined in 400 healthy male recruits entering military service, and a record of the blood pressure was made some ten years subsequently in four other groups of cases. The first group consisted of 50 young men in whom the blood pressure was normal. The second held 50 young men in whom the blood pressure was somewhat raised so that the systolic was 180 mm. Hg. or over and/or the diastolic was 100 or over. The third group was made up of 50 older subjects of both sexes who showed higher blood pressure values so that the systolic pressure was 200 mm. Hg. or over and/or the diastolic pressure 110 or over, but where cardio-arterial changes were absent. The fourth group included 50 older patients of both sexes with blood pressure readings of the same order as patients in the third group, but in whom cardio-arterial changes were present. The last two groups were assembled during the same period and were consecutive cases presenting for routine examination. The assembling of the 50 cases of hypertonia was completed two months ahead of the hypertension group, establishing the commoner incidence of hypertonia.

A study of these five groups emphasised the need to revise the views customarily held on the reading which may be accepted as a natural blood pressure value in healthy subjects. It became clear that moderately high values in young people did not presage a significant hypertension in later life, and that the high blood pressure met with in older adults carried no sinister meaning provided it was of the mutable kind and not associated with cardio-arterial derangement, instanced specially by refractory contraction of the lesser arteries and electrocardiographic proof of left ventricular hypertrophy.

In order to distinguish this innocent condition from arterial hypertension where an abiding high blood pressure is associated with specific cardio-arterial changes, it is apposite to apply to it a distinctive name, and *hypertonia* is here proposed for it.

There are many reasons why a recognition of hypertonia as a separate clinical entity is needed. Chief among them is the favourable prognosis associated with hypertonia and which is in sharp contrast with the serious

outlook in patients with arterial hypertension. This differentiation will avoid unwarranted invalidism, which is now rife and the inevitable outcome of an erroneous diagnosis, and it will particularly avoid the unjust loading of premiums for life assurance which is such common current practice.

To misjudge in diagnosis is to err in treatment. To mistake hypertonia for hypertension may not cause a life to burn out, but it will make it burn low; the addition of heroic hypotensive measures when unneeded is certain to subdue the flame. It does not cause surprise that therapy of any sort will appear to ameliorate symptoms that may arise in association with hypertonia in that they are incidental to it. If a condition is innocent enough, as this is, not to maim through the years, we should guard against accrediting a symptomless period to any potion fortuitously prescribed at the time. Moreover, it is imprudent to dispense medicine continuously to a patient which serves as a constant reminder of a disability which is more imaginary than real. Even in the case of true arterial hypertension, reflection on the underlying pathology in the form of severe closure of so many essential arteries by intimal proliferation, prevents any surprise that neither product of test-tube or crucible halts, nor delays materially, the unfavourable course of the disease.

A contribution to the improved management of patients described here is to oppose a diagnosis of arterial hypertension in any where the blood pressure is raised, even to substantial levels, but where it proves to be mutable, and where a normal electrocardiogram endorses the absence of left ventricular hypertrophy.

I wish to acknowledge the help given me by Dr. D. S. Short during the examination of the military recruits at their second attendance.

POLYNEURITIS REQUIRING ARTIFICIAL RESPIRATION

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RESPIRATORY failure following bulbar and respiratory paralysis is the main cause of death in polyneuritis of the Landry-Guillain-Barré type. Haymaker and Kernohan (1949) reported that in 47 of 50 cases which came to necropsy respiratory failure was the final event; in the remaining 3 cases death resulted from cardiovascular complications which may well have been aggravated by respiratory insufficiency. We believe that, if adequate ventilation can be maintained throughout the acute phase of the illness, even the most severe cases can recover. Indeed, nothing is more gratifying than to follow the progress of such a patient from almost total paralysis to normal activity.

We describe here our experiences in the management of patients who received respiratory assistance in cabinet respirators or with intermittent positive-pressure respiration.

In the past three years 10 patients with severe polyneuritis requiring artificial respiration were admitted to the Respiratory Unit in the National Hospital, Queen Square. In the 9 cases with bulbar paralysis a tracheotomy was done. The first 5 patients (including the patient without a tracheotomy) were treated in a Siebe-Gorman cabinet respirator; 2 of these patients died. The next 5 patients were treated by tracheotomy and positive-pressure respiration with a Beaver respirator (Beaver 1953, Beaver and Byford 1954), and all made a good recovery.

The mortality in this series was 20%. Comparison with the mortality in previous series is difficult because the peripheral form of Guillain-Barré polyneuritis and the ascending form of Landry paralysis were considered by some workers to be separate entities. There is also lack of evidence in the published reports about the degree of respiratory involvement. It is otherwise hard to reconcile the series of Guillain (1936), who claimed that respiratory involvement was never severe and who had no fatal cases, with that of Forster et al. (1941), who lost 11 of 13 patients requiring respiratory assistance.

Taylor et al. (1932) stated that death from respiratory involvement was rare, but in their series respiratory involvement was uncommon; only 2 of their 16 patients had respiratory difficulty, and 1 of these died.

Holmes (1917), with 12½% mortality, and Bradford et al. (1918), with 26% mortality, did not make it clear what proportion of their patients had severe respiratory involvement.

Viets (1927) reported 2 cases, 1 of them fatal.

Gilpin et al. (1936) reported 14% mortality, but it is impossible to estimate the extent of paralysis.

Roseman and Aring (1941), in a series of 16 cases, lost 3 of 6 patients who had respiratory paralysis and 3 of 5 who had combined respiratory and bulbar paralysis.

Lassen and Fog (1943) reported 15 cases; 10 of 11 patients who appeared to have severe respiratory weakness died.

Dempsey et al. (1948) reported that 1 of 18 patients died, but they do not mention how many had respiratory paralysis.

From reports published in the first half of this century our impression is that the mortality in patients with respiratory paralysis was extraordinarily high.

Experience with tracheotomy and intermittent positive-pressure respiration in bulbospinal poliomyelitis (Lassen 1953, Macrae et al. 1953, Smith et al. 1954, Harries and Lawes 1955, Spalding 1955) led to the adoption of this method of treatment in respiratory failure due to a variety of causes. Smith et al. (1954) reported the successful treatment of 2 patients with severe combined respiratory and bulbar paralysis by tracheotomy and intermittent positive-pressure respiration. Spalding (1956) intimated that this success was being maintained.

In the 10 patients reported below there was paralysis of the utmost severity, and 5 of the patients had complete quadriplegia, absence of spontaneous respiration, and severe bulbar paralysis.

Case-reports

Case 1.—A man, aged 61, had his first attack of polyneuritis with peripheral weakness of the legs and arms and bilateral facial weakness in March, 1949. Recovery was slow. His cerebrospinal fluid (C.S.F.) contained protein 100 mg. per 100 ml. He had two subsequent minor attacks of polyneuritis. He had a history of asthma and penicillin sensitivity. On Jan. 7, 1954, he was admitted to the National Hospital with seven days' history of rapidly progressive weakness and two days' history of respiratory and bulbar paralysis. He had been given cortisone 200 mg. daily for six days before admission.

On examination he was cyanosed and unable to move his limbs, cough, or swallow. There was negligible spontaneous respiration.

Treatment and Progress.—He was put into a cabinet respirator, but an endotracheal tube was passed because his airway was inadequate. As a result of this his condition slowly improved, with some return of spontaneous respiration. He required sedation to enable him to synchronise his breathing with the respirator. On Jan. 8, 1954, the endotracheal tube was removed. In view of the persisting combined weakness of respiratory and bulbar muscles, a tracheotomy was done. During the operation the patient became asphyxial and died. He would probably have survived if adequate ventilation had

been maintained through the endotracheal tube during the tracheotomy.

Necropsy Findings (Dr. W. Blackwood).—Bronchopneumonia and partial lower-lobe collapse were found. On microscopy no significant abnormalities were found in the medulla, the pons, or the cerebellum. Sections of the cervical and lumbosacral enlargements of the spinal cord did not show any loss of anterior-horn cells. The cytoplasm of some of these cells, however, was shrunken, with shrinkage and wrinkling of the nucleus. Degeneration in the posterior columns was not found. Occasionally in the anterior nerve-roots and noticeably in the posterior nerve-roots there were swelling of the axons and distension of myelin sheaths, with prominence of cell nuclei. Sacral nerve-root ganglia and posterior nerve-roots showed loss of myelinated fibres, with slight lymphocytic infiltration, increase in the number of Schwann cells and fat in phagocytes. Occasional groups of small mononuclear cells were evidence of degeneration of nerve cells. Sacral anterior spinal nerve-roots (also near ganglia) appeared healthy. The common peroneal nerve showed a considerable loss of myelinated nerve-fibres. The peroneal muscles appeared healthy. Nerve bundles in the muscle showed loss of myelinated fibres. The evidence suggested that these were sensory fibres.

Case 2.—A married woman, aged 40, was admitted to the National Hospital on Jan. 23, 1954, with three weeks' history of productive cough. Five days previously she had noticed rapid onset of weakness of the legs and arms, and three days later difficulty in breathing. Examination at another hospital showed weakness of the legs and proximal weakness of the arms with absent reflexes. There was moderate facial weakness. She had episodes of embarrassed respiration and was admitted to the National Hospital on the sixth day of her illness.

On examination the weakness had progressed and she had difficulty in swallowing. Her cough was ineffective, and the accumulation of secretions in her pharynx necessitated treatment with postural drainage.

Treatment and Progress.—On Jan. 25, 1954, the respiratory and bulbar paralysis increased and it became necessary to pass an endotracheal tube. After suction through the tube and the institution of positive-pressure respiration with an anæsthetic machine her condition improved somewhat, and after bronchoscopy she was placed in a cabinet respirator. On the same day treatment with corticotrophin 100 mg. daily was begun. A planned tracheotomy was done on to the tube, but respiration in the cabinet respirator was never satisfactory, and she remained cyanosed. She was given tubocurarine to enable her to adapt herself to the machine. Her level of consciousness had progressively deteriorated from Jan. 25, 1954. Death on Jan. 27, 1954, was due to anoxia as a result of failure to aerate the lungs.

Necropsy Findings (Dr. W. Blackwood).—Pulmonary collapse of the right lung and bronchopneumonia of the left were found. Microscopically the most prominent histological changes were found close to the posterior nerve-root ganglia. In this region considerable breakdown of myelin with much sudanophil lipid was seen in both anterior-root and posterior-root fibres, most of it being present in phagocytes. In addition there was much local infiltration by small round cells. Close to the spinal cord the changes in the nerve-roots were much less, and distally in the peripheral nerves only swelling of capillary endothelial cells was seen. In the posterior nerve-root ganglia there was cellular increase but no obvious loss of nerve-cells. In the spinal cord and the medulla nothing abnormal was found except occasional shrinkage of nerve-cells and perivascular cuffing by lymphocytes. The limb muscles did not show any abnormality.

Case 3.—A boy, aged 8 years, was admitted to another hospital on March 18, 1954, with two and a half weeks' history of malaise, pyrexia, and cough. A week later he developed pins-and-needles in his hands and feet and pains in his limbs. A week before admission he developed a left ptosis. Over the next three days he developed palsy of his left external rectus and superior oblique muscles, bilateral ptosis, and meningism. His intercostal movements became impaired, and his tendon reflexes were absent. Respiratory weakness increased, and he developed bilateral facial palsy and much weakness of his limbs. His C.S.F. was normal. He was put in a cabinet respirator but became distressed and was transferred to the National Hospital on March 21, 1954.

On admission to the National Hospital he had bilateral ptosis and complete external ophthalmoplegia and could neither cough nor swallow. Intercostal and diaphragmatic movements were feeble. He had virtually no power in his limbs.

Treatment and Progress.—He was placed in a cabinet respirator, but this treatment was unsuccessful despite postural drainage. He was intubated under anæsthesia and a tracheotomy was done after suction through the tube. A shortened cuffed Magill's endotracheal tube was used as the tracheotomy tube. Humidification was maintained by passing a mixture of 50% nitrogen at 4 litres a minute through a humidifier to the side-arm of a metal T-tube fixed in the tracheotomy tube. The main problems for some weeks were recurrent pulmonary collapses and the tendency of the tracheotomy tube to kink. In later cases moulded shaped rubber tracheotomy tubes with interchangeable inflatable cuffs were used. Intermittent positive-pressure respiration was used during nursing procedures and physiotherapy out of the cabinet. A month after admission the boy spent short periods out of the respirator and was gradually weaned on to a rocking bed. In ten weeks his extraocular movements had fully recovered and power in his face and limbs had greatly improved. After three months he no longer required respiratory assistance, and the tracheotomy was closed. His vital capacity was then 700 c.cm. He was discharged eight months after admission, able to do everything for himself and to walk a few paces without assistance. There was still moderate weakness of his hands and of the dorsiflexors of his feet. Two years later he was quite well, apart from residual bilateral foot-drop; but the tendon reflexes remained absent.

Case 4.—A man, aged 30, was admitted from Khartoum on April 8, 1954, with ten days' history of pain in the back, neck stiffness, fever, and weakness first of his neck extensors and then of his shoulder and hip girdles. He had had respiratory weakness for a week and had been placed in a cabinet respirator. At that stage his C.S.F. contained protein 350 mg. per 100 ml. but no cells. Later a cuirass respirator was applied, and he was flown from Khartoum.

On admission to the National Hospital he had much proximal weakness of his limbs, and his deep reflexes were absent. There was slight diaphragmatic movement but no intercostal movement. No bulbar weakness was evident.

Treatment and Progress.—He was put into a cabinet respirator, and for nursing procedures he was taken out and respiration was assisted with positive pressure through a mouthpiece (Beaver and Gilliatt 1953). For the first ten days he had increasing paræsthesiæ in his limbs; but these sensations then disappeared. Within a fortnight of admission weaning from the respirator was begun, and two months after admission, with a vital capacity of 1 litre, he was able to dispense with respiratory assistance. Motor power in his limbs was very slow to improve. After he had been out of the respirator for three weeks his vital capacity fell to 400 c.cm., he became confused, and his pulse-rate rose. He was put back into the cabinet respirator. He was given cortisone 200 mg. daily for two days and thereafter 100 mg. daily. He improved rapidly, and after four days weaning from the respirator was again begun. Cortisone was reduced and discontinued after a month. After three weeks artificial respiration was discontinued. Muscle power continued to improve slowly but incompletely. Over the following year his limb girdles remained extremely weak, though distally power recovered virtually to normal.

Follow-up.—Thirty-three months after his admission his proximal muscles were still weak, but he had been following a sedentary occupation for about a year.

Case 5.—A man, aged 32, was admitted to the National Hospital on June 21, 1954. On June 10, 1954, he had noticed pain in his right thigh and, later, weakness and numbness of both legs. His muscles were tender, and about three days later his arms became weak, with numbness up to the elbows. Next day he had numbness of the left corner of his mouth, inability to close his right eye, blurring of vision, and pain in his back. He was admitted to another hospital on June 18, 1954, with right lower-motor-neurone facial weakness and flaccid quadriplegia, which was complete in the legs. He had lost all his deep tendon reflexes. His C.S.F. contained protein 60 mg. per 100 ml. Over the next three days he had difficulty in swallowing and in breathing and was put into a cabinet respirator. Because of accumulation of bronchial secretions and increasing cyanosis he was transferred to this hospital. Before transfer a cuffed endotracheal tube was passed under anæsthesia by one of us. With the establishment of a clear airway the patient required little respiratory assistance. He was sedated with intravenous pethidine.

On admission he was conscious and coöperative, breathing comfortably through the endotracheal tube without mechanical assistance. Movements of his eyes laterally were poorly sustained and his left external rectus muscle was weak. He had bilateral lower-motor-neurone facial weakness and could not swallow, and his intercostal muscles were weak. He had moderate flaccid weakness of his arms, fair power in his trunk muscles, and severe flaccid weakness of his legs, but he could move them at each joint with gravity eliminated. All deep tendon reflexes were absent, as were the abdominal and plantar responses. Cutaneous sensation was impaired below the elbows and below the mid-thigh level. Although on admission he was breathing comfortably, it became evident that he would need assisted respiration.

Treatment and Progress.—Since he had bulbar paralysis in addition to respiratory-muscle weakness, a planned tracheotomy was done on the morning of his admission. He spent considerable periods outside the respirator at this time and dispensed with it altogether after two days. About five days after admission his chest and his general condition had considerably improved. He could swallow, the tracheotomy tube was removed, and he made an uninterrupted recovery.

Follow-up.—A year later he had made a complete recovery.

Case 6.—A woman, aged 49, was admitted to the National Hospital on May 7, 1955, with five days' history of pins-and-needles in both hands and upper lip, followed by weakness of the arms and legs, becoming progressively worse in the twenty-four hours before admission. On examination at another hospital she had a slight facial weakness, flaccid weakness of all four limbs, and no tendon reflexes.

On admission to this hospital she was a small obese woman, with a very short neck and difficult respiration. Her intercostal muscles were completely paralysed and diaphragmatic movements weak. She had a slight bilateral facial weakness and a flaccid weakness of all her limbs. She was deficient in joint-position sense in her fingers and toes. Her C.S.F. contained 25 cells per c.mm., of which 14 were polymorphs, and protein 30 mg. per 100 ml.

Treatment and Progress.—She was placed in a cabinet respirator. Because her airway was not clear, she was intubated and put on a Beaver positive-pressure respirator. Next day a tracheotomy was done because of increasing bulbar paralyses, and intermittent positive-pressure was maintained. The tracheotomy was technically difficult because of her short neck and because of an aberrant right innominate artery. The cuffed rubber tracheotomy tube had to be shortened. Weakness continued to increase, involving the extraocular muscles, pharyngeal muscles, and neck muscles, and the limbs became weaker. She was treated with corticotrophin gel 40 mg. daily for ten days. Over the next week she gradually improved and spent short periods disconnected from her machine. The power in her limbs and swallowing also improved. By the end of May the tracheotomy tube was removed, she was breathing well, her limbs increased in power, and her eye movements improved.

Follow-up.—Re-examination eighteen months after discharge showed some residual distal weakness in the limbs, absent reflexes, and sensory ataxia in the legs.

Case 7.—A woman, aged 53, was admitted to the National Hospital on April 27, 1956, with two weeks' history of paræsthesiæ in the tips of her fingers and toes. Over the next two weeks she rapidly lost the power in her arms and legs and developed respiratory-muscle weakness.

On admission she was an obese short-necked woman with considerable difficulty in swallowing, dyspnœa, and slight cyanosis. She had bilateral weakness of her external recti muscles, and generalised weakness of all four limbs, much more marked in the proximal than in the distal muscles. All her tendon reflexes were absent, and she had sensory changes confined to the glove and stocking areas. Her vital capacity was 500 c.cm. Her C.S.F. contained protein 300 mg. per 100 ml.

Treatment and Progress.—In view of the severe combined respiratory and bulbar paralysis a planned tracheotomy was done under anæsthesia, and respiration was maintained with a Beaver machine. Over the next few days the weakness spread further. At one time the only voluntary muscle power was limited to eye movements. After three weeks the patient slowly began to improve. A month after admission she could breathe without the machine. After three months her tracheotomy was closed; her vital capacity at this stage was 2000 c.cm. Her limbs improved, and at the end of three months she was walking without assistance. By the time of discharge on Nov. 10, 1956, she had not completely recovered: she had considerable weakness in her gluteal muscles and in dorsiflexion of her fingers, but sensation had returned completely. She complained of dizziness when convalescing, and bilateral labyrinthine disturbance, which could have been the result of peripheral neuritis, was found.

Case 8.—A man, aged 33, was transferred from another hospital on Sept. 15, 1956, with rapidly progressing polyneuritis, which had begun only two days before his admission. At the time of its onset he was recovering from a modified thoracoplasty a fortnight earlier and had been receiving *p*-aminosalicylic acid and isoniazid for nine months. His C.S.F. contained protein 83 mg. per 100 ml. He was put into a cabinet respirator but became cyanosed and distressed. After intubation under anæsthesia he was transported to the National Hospital on a portable Beaver positive-pressure respirator.

Treatment and Progress.—A planned tracheotomy was done because his bulbar and respiratory paralysis persisted, and thereafter, for two months, respiration was maintained by a Beaver positive-pressure machine. His weakness progressed to an extreme degree, and at the end of the first week there was complete absence of movement in all four limbs and he was just able to protrude his tongue. He could not swallow and had bilateral facial weakness. Sensory changes accompanied this deterioration and involved all modalities in a symmetrical fashion, and tendon reflexes were absent. His C.S.F. contained protein 180 mg. per 100 ml. After three weeks he began to improve. After seven weeks he was weaned from the positive-pressure machine. By mid-December there was minimal sensory deficit, and with this there was a progressive return of muscle power. Three months after admission the patient could walk, his respirations were adequate, and the tracheotomy was closed. The patient was thus adequately ventilated by positive-pressure respiration despite immobilisation of the right side of the chest by thoracoplasty. In view of the possible relationship of the polyneuritis to isoniazid therapy he was treated with pyridoxine (Biehl and Vilter 1954).

Case 9.—A man, aged 59, who had had chronic bronchitis for years, was admitted to the National Hospital on Aug. 20, 1956, with a history that, a year before admission, he had had pins-and-needles in his feet; three months later his fingers and hands became involved; four months after the onset he noticed weakness of his legs and hands, and cramping pains developed in his limbs; and seven months after the onset he developed paræsthesiæ around his mouth and numbness distally, extending to knees and elbows. He was treated at another hospital with cortisone, thiamine, and dimercaprol without improvement three months before admission. A month before admission he began to improve slightly; he then deteriorated, and the muscles of his neck and shoulder became involved. Paræsthesiæ extended to involve neck and occiput.

On admission his facial and bulbar musculature appeared normal; there was severe general wasting of his limbs; and he had no movement in the feet and hands, apart from slight finger flexion. His proximal musculature was slightly less involved but was also profoundly weak. All his tendon reflexes were absent. He had dense sensory loss below the elbows and knees to all modalities of sensation, and moderate sensory loss below the hips and shoulders. His C.S.F. contained protein 220 mg. per 100 ml.

Treatment and Progress.—Six weeks after admission he suddenly deteriorated and became confused. Movement of his diaphragm was impaired, and a basal segment of his left lung collapsed. Postural drainage and percussion led to re-expansion of the collapsed segment. To exclude a bronchial carcinoma bronchoscopy and bronchography with iodised oil were done and proved negative. Two days after the bronchography pulmonary œdema developed. The patient, at this stage, was confused, and further weakness of his arms and legs and slight difficulty in swallowing developed. An endotracheal tube was passed, and, after suction, the respiration improved slightly. The endotracheal tube was removed, but next day the patient was again restless and cyanosed, and it became evident that he required assisted respiration. Because of large amounts of secretions, an ineffectual cough, and slight bulbar weakness, a tracheotomy was done on Nov. 6, 1956. Positive-pressure respiration with a Beaver machine was only necessary for a few days. On Nov. 14, 1956, a course of cortisone was begun at 200 mg. daily for a week, which dose was gradually reduced over the next four weeks. He is at present on a maintenance dose of 50 mg. daily. Examination on Dec. 13, showed that power in most muscle groups had

returned to normal, and he was normal mentally and had no difficulty in swallowing. His tracheotomy was closed on Jan. 7.

Case 10.—An obese short-necked woman, who had had winter bronchitis for years, gave a history of rapid onset of severe weakness of the legs four days before admission to this hospital on Nov. 1, 1956. She noticed abnormal sensations in her feet as if walking on air. The weakness quickly spread to her arms, and on admission to another hospital she was dyspnœic and could not walk or sit up in bed. Her legs and arms were very weak, especially proximally. Her tendon reflexes were absent and pinprick sensation grossly impaired in her legs. Her C.S.F. was normal.

On admission, after an ambulance journey during which she had become increasingly distressed and had been given artificial respiration manually, she was found to have severe central cyanosis and to be unresponsive to all forms of stimulation. There were ineffectual respiratory movements. An endotracheal tube was passed, and positive-pressure respiration with a Beaver machine was started. Her colour improved almost immediately, and she regained consciousness.

On examination she had bilateral facial weakness. She could nod and shake her head weakly and shrug her shoulders slightly. She could not abduct her arms, and all her other muscle groups were weak, especially those of her abdomen. She could not move her hips and knees against gravity, but she could move her ankles and toes slightly. She had sensory impairment in the glove and stocking areas. All her tendon reflexes were absent.

Treatment and Progress.—Next day a tracheotomy was done and intermittent positive-pressure respiration continued. During the next few days the paralysis of her limbs became complete. She could not swallow and had attacks of flushing, associated with generalised sweating, increase of blood-pressure, and bronchospasm lasting about 15 minutes and occurring three or four times a day. The nature of these remained undetermined. Arterial puncture during such an attack showed no change in the pCO_2 or oxygen saturation of the blood. No 5-hydroxy-indole acetic acid was found in the urine. A week after her admission her C.S.F. contained protein 140 mg. per 100 ml. Three weeks after admission her power began to return, and a month after admission she could breathe unaided. Her tracheotomy was closed on Jan. 24.

Discussion

The progress of these 10 patients confirms the view that even severe involvement of the bulbar and respiratory muscles need not affect the prognosis in polyneuritis, if the respiratory insufficiency is adequately treated.

We have not included in this series patients whose respiratory-muscle weakness was not severe enough to require mechanical assistance or those with bulbar paralysis or combined respiratory and bulbar weakness of a lesser degree who could be and were successfully treated by posture and physiotherapy. The 10 patients whom we have discussed would not, in our opinion, have survived without mechanical artificial respiration.

There are several factors in the successful management of these patients. The first and foremost is the maintenance of a clear airway; and, where severe bulbar weakness complicates respiratory paralysis, tracheotomy is essential to permit adequate suction and to prevent the aspiration of secretions. With an endotracheal tube in place, tracheotomy is not done as an emergency operation but under conditions favourable to patient and surgeon.

The second factor is positive-pressure respiration, which, combined with tracheotomy, has been the greatest advance in recent years in the management of respiratory failure complicated by bulbar paralysis. The machines used in this Unit are those developed by Beaver, which have proved reliable and easy to manage.

The first 5 patients in this series were treated in a cabinet respirator. The deaths of case 1 during tracheotomy and of case 2, in whom bronchopneumonia and massive pulmonary collapse supervened, can be largely attributed to inexperience and not to the method of artificial respiration used. Cases 3, 4, and 5 were treated adequately in the cabinet, but case 4 had no bulbar involvement and case 5 required only little respiratory assistance. Though these patients recovered with the use of the cabinet respirator, they posed very great problems in nursing and physiotherapy. Moreover, the neck seals of most cabinet respirators are ill adapted for use with tracheotomy. These problems have disappeared with the adoption of positive-pressure respiration.

The third factor for the successful management of the patients is their proper transport. For this there should be an emergency team comprising an anæsthetist and a physician (Smith et al. 1954, Russell 1956). We wish to emphasise that all cases of polyneuritis, except cases with mild and uncomplicated paralysis of respiratory muscles, requiring admission to a respiratory unit should be regarded as severe for the purposes of transport. Indeed, they may become so on the shortest journey, and the ambulance is no place to establish an airway or to deal with respiratory failure or aspirated vomit. It can be done but is as unnecessary as it is dramatic. Before the journey starts, a clear aspiration-proof airway should be established by passing a cuffed endotracheal tube. With the care due to a gravely ill patient, who may be anoxic and liable to regurgitate gastric contents, this may be done under anæsthesia. With the tube in place respiration may be maintained as necessary either with an anæsthetic bag and valve connected to an oxygen cylinder or with a battery-driven positive-pressure machine. A portable foot-operated sucker must be at hand. A Gordh intravenous needle is inserted for the easy administration of drugs. Under these conditions we see no reason to withhold sedation. We have found that small effective doses of intravenous pethidine make the journey comfortable for the patient while not clouding the clinical picture during examination on arrival.

Cases 5 and 8 were transported by the team without undue anxiety for us or the patient. In contrast case 10 was sent from a nearby hospital with what was considered to be adequate spontaneous respiration and arrived moribund with manual artificial respiration through an inadequate airway.

Patients with severe respiratory insufficiency required assisted respiration for periods up to twelve weeks. Artificial respiration may produce inadequate or excessive ventilation, with consequent changes in the blood-gas tensions of oxygen and carbon dioxide, alterations in pH, and, in turn, other biochemical abnormalities (Astrup et al. 1954, Joels et al. 1957). For this reason frequent determinations were made of electrolytes and blood-gases.

All our patients were treated with intravenous 'Parentrovite,' and this received support from the fact that in cases where the pyruvate metabolism was investigated it was abnormal.

Either cortisone or corticotrophin was administered in 5 cases. The results cannot be estimated in cases 1 and 2, where death was probably due to inadequate ventilation. Case 4 was treated with cortisone, and Clarke et al. (1954), who reported the case, considered this to have been of benefit. In case 6 it did not obviously influence the course of the disease, but case 9 appeared to benefit considerably. The 5 other patients received neither cortisone nor corticotrophin and all made good recoveries.

Follow-up of our patients up to three years after leaving hospital showed that recovery was good and still continuing but was complete in case 5 only. Residual weakness so long after the illness was much commoner in our series than has previously been reported. This is probably due to the fact that patients as severely affected as those we describe usually died. We conclude that, with correct management, all patients with acute infective polyneuritis should survive the phase of respiratory failure and make a good, if not complete, recovery.

Summary

10 cases of polyneuritis with respiratory failure requiring mechanical respiration are described.

The need to use tracheotomy, positive-pressure respiration, and correct transport of the patient to the respiratory unit are emphasised.

The recovery of the 8 patients who survived has been good, though not complete in every case, even after three years.

With adequate management the mortality of acute infective polyneuritis with respiratory involvement is small, and the severity of paralysis is no criterion of the ultimate degree of recovery.

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HYPERALDOSTERONISM IN HEART-DISEASE*

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IT has been shown that tubular retention of sodium due to increased secretion of aldosterone by the adrenal cortex plays an important part in the formation of œdema and ascites in hydropic disease of cardiac, renal, and hepatic origin. Until now, however, few observations have been published on the factors evoking hyperaldosteronism and on its frequency and degree in decompensated heart-failure (Duncan et al. 1956, Muller et al. 1956a and b). The investigation described here was designed to acquire information about this.

Patients, Methods, and Collection of Data

Included in this study were 30 normal subjects, 21 patients with both pulmonary and systemic congestion, 8 patients with "left-sided failure," 7 patients with "right-sided failure," and 4 patients with circulatory failure due to recent myocardial infarction.

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Urine volume (12 hours) and excretion of aldosterone (twenty-four to thirty-six hours) and sodium were measured once or repeatedly in all patients, glomerular filtration-rate and tubular reabsorption of sodium in most of them. Analytical data were collected before treatment and during periods of digitalisation and varying salt intake. Moderate salt restriction was achieved with a diet containing 60–80 m.eq. of sodium daily, and severe salt restriction by additional administration of 40–60 g. of cation-exchange resin † daily.

None of the patients classified as untreated had received diuretics and/or dietary treatment for at least three weeks, and digitalis for at least a week before this investigation.

The plasma volume, serum osmolarity, serum-electrolytes, and tubular reabsorption of sodium and water were determined in 3 patients with ascitic cardiac cirrhosis before and after abdominal paracentesis.

Extraction, separation, identification, and estimation of aldosterone in the urine was performed by the physico-chemical method of Neher and Wettstein (1956). Analytical details have been reported elsewhere (Wolff et al. 1956a). Urinary sodium was determined by flame photometry, serum osmolarity by the freezing-point method, using standards corrected for activity coefficients. Changes in plasma volume were registered by the Evans-blue method and hæmatocrit and hæmoglobin measurements. Twenty-four-hour clearances of

† 'Masoten' (Bayer), carboxylic resin, hydrogen form, 25% potassium load.

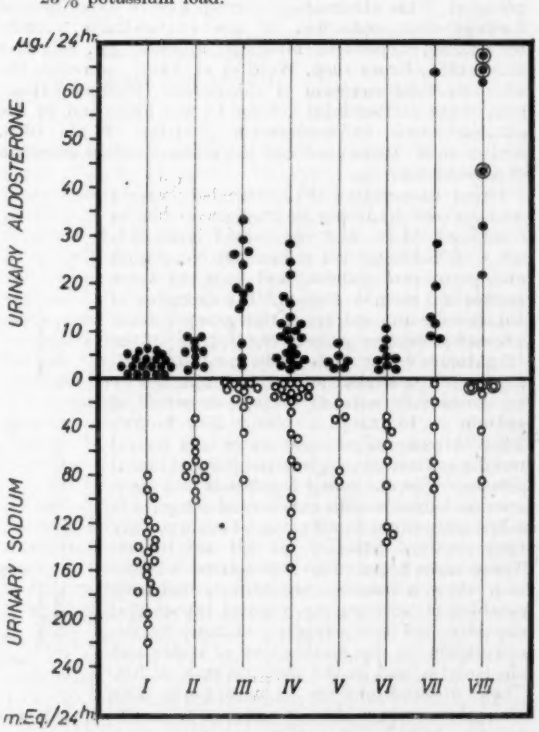

Fig. 1—Excretion of aldosterone and sodium in healthy people on various intakes of salt and in patients with heart-disease.

I. Healthy people on unrestricted intake of salt.
II. Healthy people on 60–80 m.eq. of sodium daily.
III. Untreated patients with hydropic "left- and right-sided heart-failure."
IV. Patients with hydropic "left- and right-sided failure" treated with digitalis and moderate salt restriction (60–80 m.eq. daily).
V. Patients with hydropic "left- and right-sided failure" after loss of œdema.
VI. Patients with decompensated "left-sided failure."
VII. Patients with decompensated "right-sided failure."
VIII. Patients with decompensated heart-failure and cardiac cirrhosis before (single rings) and after (double rings) removal of ascites by abdominal paracentesis.

insulin and endogenous creatinine served for the estimation of glomerular filtration-rate. Tubular reabsorption of sodium was calculated from plasma-sodium, urinary sodium, and glomerular filtration-rate.

Results and Discussion

Group I consisted of 20 healthy people on an unlimited intake of salt. Their excretion of aldosterone and sodium is shown in fig. 1, I. These persons served as controls for the untreated heart patients. Group II consisted of 10 healthy people on a moderately restricted intake of salt (60–80 m.eq.Na daily) for six days. Their excretion of aldosterone and sodium is also shown in fig. 1, II. This group served as controls for groups III–VIII, heart patients on the same diet.

Since hyperaldosteronism in hydropic heart-disease is evoked primarily by pathological changes of cardiovascular hæmodynamics due to cardiac decompensation, only moderate salt restriction was applied to most patients in this investigation to outline more clearly the adrenocortical response to circulatory improvement produced by digitalis and rest in bed, and to avoid the interfering effects of sodium depletion.

As expected, the excretion of aldosterone was greater and that of sodium less in group II than in group I. This observation corresponds to experimental findings that reduction of the extracellular volume by sodium depletion, bleeding, diuresis, &c. (Bartter et al. 1956, Gross 1956, Wolff et al. 1957), activates the adrenocortical secretion of aldosterone, whereas expansion of the extracellular volume by salt loads and by the administration of vasopressin (Bartter et al. 1956, Muller et al. 1956a) reduces the adrenocortical secretion of aldosterone.

Group III consisted of 12 untreated patients with severe hydropic heart-disease due to combined "left- and right-sided heart-failure." All of them had pulmonary congestion and peripheral œdema, and most of them ascites and pleural effusion. The excretion of aldosterone and sodium of this group did not present a uniform pattern (fig. 1, III). Of the 12 patients 9 had moderately increased urinary excretion of aldosterone, accompanied by an excessively reduced urinary excretion of sodium (<10 m.eq. in twenty-four hours). These 9 patients retained water and gained weight, indicating progressive hydropic heart-disease. The remaining 3 patients had aldosterone values within the normal range. On a diet containing 60–80 m.eq. of sodium daily they retained little or no salt and water. These cases apparently represented a situation where a transient equilibrium had been established between the reduced myocardial capacity and compensating changes in the circulation, in the distribution of water and electrolytes and in the patients way of life. These observations are in accordance with clinical experience that, in progressive heart-failure, periods of active retention may alternate with periods of a new steady state.

Group IV consisted of 16 hydropic patients with combined "left- and right-sided heart-failure" during treatment with moderate salt restriction, digitalis, and diuretics. In these patients the excretion of aldosterone and sodium showed considerable variations (fig. 1, IV). During improvement of myocardial function and dispersal of œdema, however, the values gradually went back to normal. When diuresis was forced by mercurial diuretics or carbonic anhydrase inhibitors, the excretion of aldosterone increased considerably for one to three days after administration. After cardiac recompensation and restitution of sodium equilibrium the excretion of aldosterone and sodium was usually within the normal range shown by group II (fig. 1, V).

In addition 3 patients with advanced pulmonary as well as systemic congestion were studied during treatment with digitalis and severe sodium restriction due to resins. Unexpectedly, two different patterns of response were observed (fig. 2). In 2 cases the excretion of aldosterone increased and that of sodium decreased considerably during therapy (A). At the same time the patients slowly lost their œdema. Thus these 2 patients responded to resins in the same way as healthy people do, compensating reduction of extracellular volume due to sodium loss by activation of the sodium-conserving aldosterone mechanism. The third patient, who had excessive pulmonary and peripheral œdema, ascites, and pleural effusion, gave the opposite response: her increased excretion of aldosterone returned, after a short initial rise, to normal, and she lost large amounts of sodium and water (B). In her response she thus resembled a healthy person loaded with saline solution, reducing the expanded extracellular volume by decrease of aldosterone activity and renal release of sodium.

This incongruous response is difficult to understand but may be explained by a different response of myocardial and fluid dynamics to digitalis and sodium loss. Rapid improvement of the myocardial function with rapid dispersal of œdema—as observed in the third patient—leads to an excessive transfer of salt and water from the abdomen and the interstitial space into the intravascular compartment within a short time. This

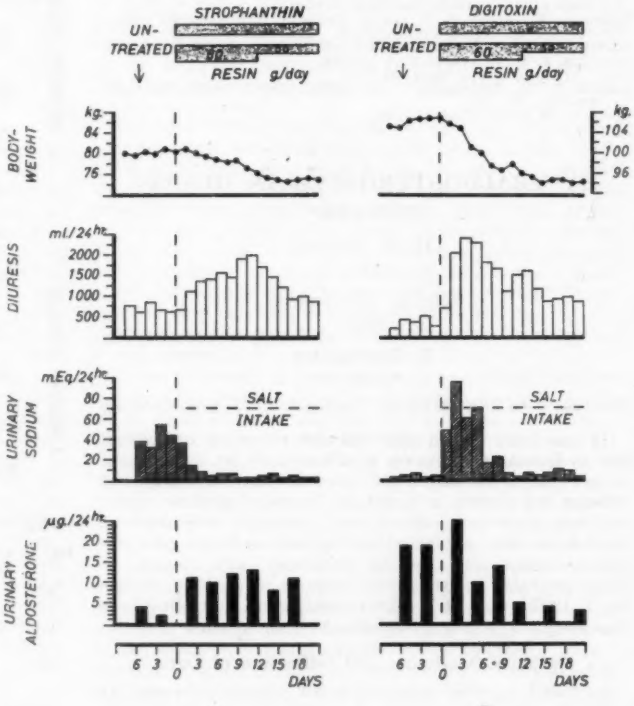

Fig. 2—Response of patients with hydropic heart-disease to severe salt restriction and heart therapy.

A. One of 2 patients responding with increase of urinary aldosterone and loss of œdema (response of other patient was essentially similar).
B. Patient responding with normalisation of urinary aldosterone and loss of œdema.

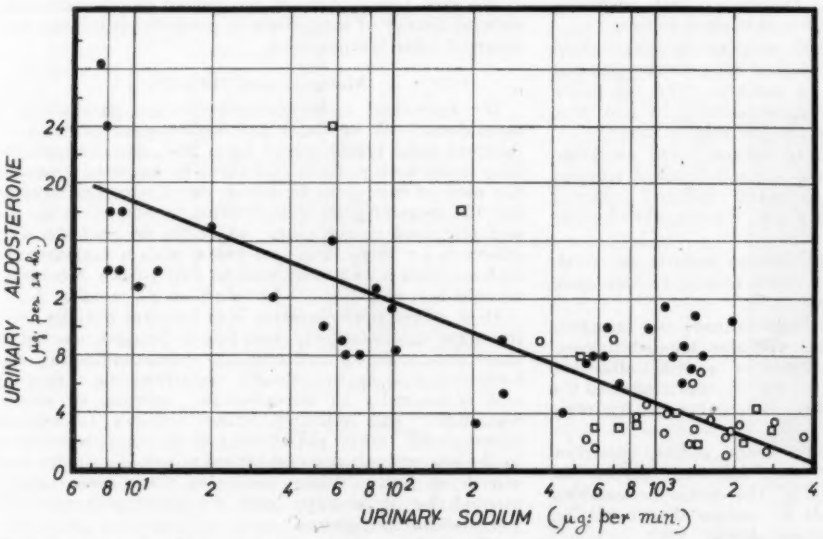

Fig. 3—Correlation between aldosterone excretion and sodium excretion in various forms of heart-disease.

Solid circles, patients with œdema; *open circles*, patients without œdema; *squares*, patients in first week after myocardial infarction.

process might be compared to an intravenous infusion of saline solution. It over-compensates simultaneous volume changes induced by acute sodium restriction and is followed accordingly by a decrease in aldosterone activity with renal release of sodium to prevent critical expansion of the circulating volume. On the other hand, in patients with slow myocardial response and slow dispersal of œdema, as in the 2 other cases, the salt and water depots represented by ascites and œdema are not available to compensate reduction of volume due to sodium loss. Here sodium restriction by resins must meet a normal response—i.e., increase of aldosterone activity and tubular retention of sodium to prevent critical reduction of the circulating volume.

Group VI consisted of 8 patients with "left-sided failure" before and during the treatment described above. All of them showed pulmonary congestion, of various degrees, but no symptoms of systemic congestion. In 7 of them, aldosterone and sodium values were within the normal range (fig. 1). Only in 1 patient with marked pulmonary œdema and pleural effusion were increased aldosterone activity and moderate sodium retention detected.

Group VI consisted of 7 patients with "right-sided failure" before and during treatment. All of them had advanced peripheral œdema, and 4 had ascites also. None showed symptoms of pulmonary congestion. In 5 of them a moderate to excessive increase of aldosterone activity was found (fig. 1). In the remaining 2 the excretion of aldosterone and sodium was normal and gross œdema and ascites were absent.

These findings in patients with discrete left- or right-sided failure are in agreement with the observation that sodium retention is manifested only by heart patients with systemic congestion and significant elevation of right-ventricular and diastolic pressure, whereas most patients with pulmonary congestion but normal venous pressure can excrete loads of sodium and water (Hollander and Judson 1956).

Group VII consisted of 3 heart patients with cardiac cirrhosis before and after removal of 5–9 litres of ascitic fluid by abdominal paracentesis. After puncture the aldosterone activity increased considerably and the excretion of sodium decreased to a mere trace. As shown in previous studies (Wolff et al. 1956a and b, 1957) acute ascites following abdominal paracentesis is accompanied by a transitory decrease of plasma volume due to the transference of fluid into the emptied peritoneal cavity. Here the activation of the adrenocortical sodium-conserving mechanism apparently replaces the intravascular losses of sodium and water.

Group VIII consisted of 4 patients recovering from recent myocardial infarction. A transient increase of aldosterone activity with reduction of sodium output was observed in all of them between the second and eighth days after the attack. After myocardial infarction the cardiovascular hæmodynamics resemble hypovolæmic shock (Feis et al. 1951). In such cases the decrease in plasma volume often exceeds 10% and may be compared to a blood-loss of more than 500 ml. As we have reported elsewhere (Wolff et al. 1957), a severe loss of blood (600 ml.) is followed by an increase in aldosterone activity and tubular reabsorption of sodium, to replace the loss of fluid. The activation of the aldosterone mechanism after myocardial infarction must accordingly be regarded as a measure to restore the normal circulating volume. In these observations (after abdominal paracentesis, bleeding, and myocardial infarction) the rôle of aldosterone in the homeostatic regulation of fluid volume becomes clearly visible. When the excretion of aldosterone by heart patients was plotted against their excretion of sodium, a negative correlation was found (fig. 3). This correlation, however, was not evident during the intestinal loss of sodium due to the administration of resins. Simultaneous determination of the glomerular filtration-rate and the tubular reabsorption of sodium showed that the latter was the main factor contributing to sodium retention in the heart patients studied.

The sequence of events leading to hyperaldosteronism in hydropic heart-disease remains to be clarified. It can be assumed that the sodium-retaining aldosterone mechanism is activated primarily by changes of cardiovascular hæmodynamics which lead to a pathological distribution of blood, water, and electrolytes. However, the resulting increase in body sodium and water does not reduce aldosterone activity and tubular reabsorption of sodium. This failure might be explained by the fact that most of the retained salt and water is segregated in the peritoneal and pleural cavity and in parts of the interstitial space, which are not sensitive to changes in their contents of sodium and water. This failure to reduce aldosterone activity after retention of sodium and water mainly contributes to the ever-increasing accumulation of œdema and ascites in many patients with hydropic heart-disease.

Summary

In 40 patients with various forms of heart-failure the excretion of aldosterone and of sodium was studied

before, during, and after treatment with digitalis, diuretics, and sodium restriction of various degrees.

Two-thirds of the untreated patients with generalised cardiac hydrops showed increased aldosterone activity and considerable retention of sodium. The remaining third showed normal excretion of aldosterone and were in or near sodium equilibrium at the time of study.

In patients with "left-sided failure" the excretion of aldosterone and of sodium was usually normal, whereas most patients with "right-sided failure" showed increased aldosterone activity and considerable sodium retention.

Different responses of aldosterone activity to treatment of heart and œdema were observed, and their probable causes are discussed.

Hyperaldosteronism in heart-failure is primarily evoked by changes in cardiovascular hæmodynamics. The failure to decrease aldosterone activity after the retention of sodium and water mainly contributes to the ever increasing accumulation of œdema in hydropic heart-disease.

Increased aldosterone activity and sodium retention were observed in the first week following myocardial infarction. This response of the sodium-conserving mechanism apparently tends to restore the circulating volume reduced by hypovolæmic shock.

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THE HILAR LYMPH-NODES IN SARCOIDOSIS

WITH SPECIAL REFERENCE TO PROGNOSIS

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BILATERAL enlargement of the hilar lymph-nodes is now known to be a common feature of sarcoidosis. The numerous published accounts of it have been concerned mainly with its relationship to erythema nodosum, its radiological recognition, and its diagnosis but have had little to say on its natural history (Pautrier 1940, Bruce and Wassén 1940, Kerley 1942, Reisner 1944, Hoyle 1947, Garland 1947, Ustvedt 1949, Longcope and Freiman 1952, Brocard et al. 1954, Wynn-Williams and Edwards 1954, Cowdell 1954, Scadding 1956). The only large group of patients studied from this point of view was reported by Löfgren and Lundbäck (1952) and Löfgren (1953), and consisted of 212 patients with early sarcoidosis, of whom 125 had enlarged hilar nodes as the sole radiological abnormality, and 70 of these had erythema nodosum. The course of the disorder was recorded in terms of the proportion of patients whose enlarged hilar nodes had regressed after observation for six months, a year, and two years. 87% of these who had enlarged hilar nodes had normal radiographs in two years.

We give here a further account of the features and natural history of sarcoidosis in patients presenting with enlarged hilar lymph-nodes.

Material and Methods

We have had under observation 200 patients with sarcoidosis; 66 of them had radiological evidence of enlarged hilar lymph-nodes when first seen, though the lung fields were normal. Of these 66 patients 6 were in the care of colleagues to whose records we had access; but the remaining 60 were referred to one of us (C. H.) and remained in our care. 33 of the 66 patients were observed for more than two years, with a maximum of sixteen years; 20 from a year to two years; 6 from six months to a year; and 7 for less than six months.

Most of the patients came into hospital initially for a few days' investigation, including a detailed account of their occupations; full clinical, ophthalmological, and hæmatological examinations; sensitivity to tuberculin and occasionally to histoplasmin; sputum or gastric washings; and repeated urine cultures to exclude tuberculosis. Serial radiographs of the chest were taken in the postero-anterior and lateral positions, usually each month at first. Where necessary these were supplemented by fluoroscopy and by anteroposterior and lateral hilar tomograms.

We tried to express the degree of enlargement of the hilar nodes by comparing the greatest width of the nodal shadow with the distance between the inner ends of the clavicles, or with the transverse diameter of the heart, or with the maximal internal diameter of the thorax; but none of these ratios seemed to us as satisfactory as a simple assessment of the size of the nodes by inspection. On the other hand, actual measurements of the width of the nodal shadow in a series of films at 6 ft. often confirmed apparent changes in size in the individual patient. It was always difficult to appreciate slight enlargements of the nodes because of confusion with vascular shadows, even in tomograms or at fluoroscopy. We relied on an appearance of non-branching shadows distinct from vessels and with a smooth outline in successive tomographic cuts; and on the coincidence of an enlarged paratracheal node. The changing size of the hilar shadow in serial radiographs was often conclusive.

The diagnosis of sarcoidosis was based whenever possible upon the presence of epithelioid-cell follicles in biopsy material. Liver biopsy was done in 40 of the 66 patients by the technique described by Mather et al. (1955). Follicles were found in 22; in addition they were found in the conjunctiva in 7, the skin in 5, superficial lymph-nodes in 3, and a bronchus in 1. Altogether the diagnosis was confirmed histologically in 34 of the 66 patients (51%). Also it depended on the radiographic appearance, the absence of *Mycobacterium tuberculosis* in cultures, and usually a low or absent sensitivity to tuberculin. A normal leucocyte pattern and an absence of progressive loss of health were also required.

After investigation most of the patients came to a special clinic each month; all but 2 of them continued to attend. They were allowed a normal life and were not treated except for complications; 2 required cortisone and antituberculous drugs for an early severe uveitis, and 4 others for progressive infiltration in the lungs.

Results

Clinical

Of the 66 patients 38 were women and 28 men. Their ages ranged from 18 to 63, but most of them were young adults aged 20–35 (fig. 1). They did not belong to any particular social class, and 90% were town dwellers. None gave a family history of sarcoidosis. Contact with tuberculosis within a year of first coming under observation was elicited from 15 of 60 patients interrogated, and either a more remote contact or a family history of

tuberculosis from another 14, giving a history of contact in 29 (48%).

Table I shows the presenting features. Of the 66 patients 28 came with symptoms which might be associated with sarcoidosis — e.g., erythema nodosum, uveitis (with facial palsy in 3 patients), skin sarcoids, polyarthritis, and parotitis. In 12 others enlarged hilar nodes were found during the investigation of various minor complaints. In a further 26 the enlarged nodes were found on routine radiography. 2 patients whose sarcoidosis presented in other ways gave a history of erythema nodosum three and seven years before the discovery of enlarged hilar nodes.

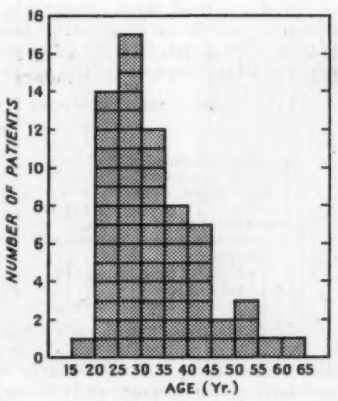

Fig. 1—Age at onset of sarcoidosis of hilar nodes in 66 patients.

TABLE I—HILAR-NODE SARCOIDOSIS: PRESENTATION IN 66 PATIENTS

Symptoms referable to sarcoidosis		28
Erythema nodosum	13	
Uveitis	9	
Skin sarcoids	3	
Polyarthritis	2	
Parotitis	1	
Routine radiography		26
Various symptoms		12
Chest pain	5	
Lassitude	2	
Wheezing (in asthmatics)	2	
Cough	2	
Dyspnœa	1	
Total		66

13 patients complained of pain in the chest at some time. It was a minor feature, but Löfgren (1953) reported it as common in his series. The pain was unilateral and varied in situation. It was usually described as sharp or stabbing and momentary, and we regarded it as functional. 11 patients had noticed it for as long as a year before their first abnormal radiograph was taken and at a time when they were otherwise well.

Abnormal signs in the chest, in particular those of bronchial obstruction, were not found. Pyrexia and a raised erythrocyte-sedimentation rate, usually trivial, were met only during the brief invasive stage of erythema nodosum, arthritis, uveitis, or parotitis. Apart from erythema nodosum 30 patients had clinical signs of extrapulmonary sarcoidosis (table II), which were present in 22 when first seen. The most important were ocular lesions (17 in 66), uveitis in 12, and conjunctival sarcoidosis in 7.

TABLE II—HILAR-NODE SARCOIDOSIS: EXTRAPULMONARY SARCOIDOSIS IN 30 PATIENTS

Ocular sarcoidosis	17
Skin sarcoids	7
Enlarged superficial lymph-nodes	5
Peripheral-nerve involvement	5
Enlarged salivary glands	3
Splenomegaly	2
Hepatomegaly	1
Bone sarcoidosis (X-ray)	1

Tuberculin Sensitivity

Sensitivity to tuberculin was usually absent or low. Of 62 patients tested 23 gave a negative reaction to 100 tuberculin units (T.U.); 10 gave a positive reaction to 100 T.U., 10 to 10 T.U., and 10 to 1 T.U. Of 13 patients who had a calcified Ghon's focus 8 gave a positive skin response to either 1 or 10 T.U. We did not find any correlation between either the presence or the degree of insensitivity to tuberculin and either the degree or the duration of enlargement of the nodes.

Radiology

The hilar nodes were considerably enlarged in 8 of the 66 patients, moderately in 48, and slightly in 10. Massive enlargement, which we have seen occasionally with infiltrative shadows in the lungs, was not met in this series; nor was unilateral enlargement, which has been reported (Scadding 1950, Löfgren 1953).

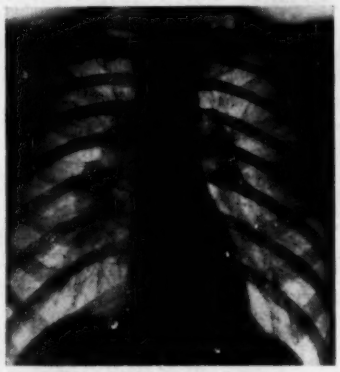

Fig. 2—Enlarged hilar nodes found in mass-radiography survey in May, 1952, in man aged 27 (see also figs. 7 and 9).

The nodal shadows, with 5 exceptions, were roughly symmetrical, in striking contrast to those of primary tuberculosis among white races. Usually their outer border was lobulated, more obviously on the right side. They were separated from the mediastinal shadow, especially on the right side, by a narrow translucent strip due to the lower-lobe bronchus (fig. 2). Their density was uniform, and no calcification was detected.

Of the various anatomical groups, the bronchopulmonary nodes lying at the divisions of both main bronchi were always enlarged. The superior tracheobronchial and paratracheal nodes were enlarged in 39 of the 66 patients, their combined shadow then extending upwards for an inch or two along the trachea, usually only on its right side. Twice they were the most striking feature.

Enlargement of the nodes below the bifurcation of the trachea was difficult to demonstrate, because of the lack

Fig. 3—Typical tomographic appearance of sarcoidosis of hilar nodes in woman aged 23, showing extensive enlargement of bronchopulmonary and paratracheal nodes. Note sharp definition of nodes and their juxtaposition to bronchial tree without obvious compression of bronchi except right middle bronchus. Shadow lying between right middle-lobe and lower-lobe bronchi is characteristic of enlarged nodes because normally there are no vascular shadows at this site.

Fig. 4—Same case as in fig. 3. Shadow lying in front of lower lobe bronchus is characteristic of lymph-node enlargement.

of contrast in tomograms at this site and the rarity of bronchial distortion. A circular or oval shadow seen in lateral hilar tomograms in the angle between the lower and middle lobe bronchi on the right and in front of the main lower lobe bronchus on the left is characteristic of lymph-node enlargement (figs. 3 and 4). Although all the enlarged nodes were adjacent to bronchi, narrowing of the bronchial lumen was uncommon and usually slight when it occurred (figs. 3 and 5). Neither clinical nor radiological evidence of bronchial obstruction was found in any of the patients in this series.

Natural History and Prognosis

The radiological course is summarised in table III. The hilar nodes of most of the patients had already reached their largest size by the time they were detected, and only 7 showed further enlargement. Often the nodes did not alter for a few months and then rapidly diminished in size within the next three months. The lung fields remained normal in 45 of the 66 patients. 33 of these 45 achieved a normal chest radiograph, the nodes regressing within a year in 26 of them. Enlarged nodes persisted unaltered in 3 patients from two to nine years without any secondary changes in the lungs (fig. 6).

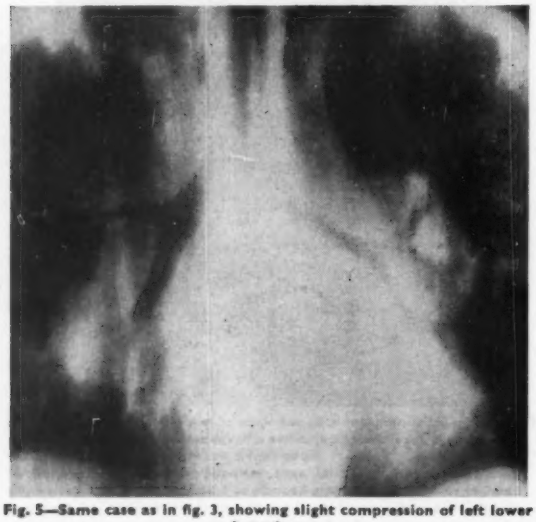

Fig. 5—Same case as in fig. 3, showing slight compression of left lower bronchus.

TABLE III—HILAR NODE SARCOIDOSIS: RADIOLOGICAL COURSE IN 66 PATIENTS

	No. of patients
Lung fields remained normal	45
Nodal shadows cleared	33
Unchanged (follow-up < 2 yr.)	9
„ (follow-up 2–9 yr.)	3
Pulmonary shadows developed	21
Normal radiograph eventually	12
Improving „ „	1
Unchanged (follow-up < 18/12)	2
Increasing shadows	3
Pulmonary fibrosis (advanced)	3

Radiological evidence of pulmonary infiltration appeared in 21 of the 66 patients: 2 had a small transient subsegmental shadow; the 19 others had diffuse bilateral mottling, either miliary or reticular, mainly situated in the mid-zone (fig. 7). This diffuse infiltration continued to increase in 6 patients and led to severe fibrosis (fig. 8) in 3 of them. The pulmonary shadows and enlarged nodes regressed completely (figs. 7 and 9) in 12 of the 21. This proportion is similar to that for patients in our series who have had pulmonary sarcoidosis in any form and have been observed for long enough; there 81 of 149 patients (54%) achieved a normal radiograph.

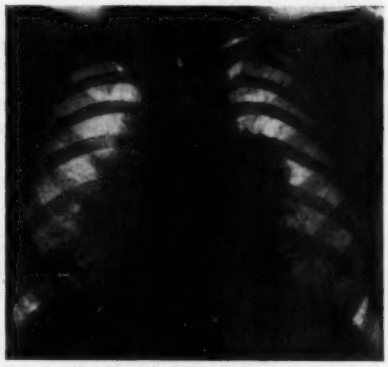

Fig. 6—Chronic bilateral enlargement of hilar nodes in woman, aged 44, seven years after diagnosis of sarcoidosis.

45 of the present 66 patients eventually had a normal radiograph—probably a conservative figure because 8 others were observed for less than eighteen months. 33 of these 45 patients achieved this within a year of discovery of the disease, with a striking preponderance between three and six months. The longest time for the others was thirty-one months (fig. 10). The time required was much the same for those with pulmonary infiltration as for those with enlarged hilar nodes alone.

The commonest clinical event in this series was erythema nodosum seen at some time in 15 of 66 patients. It was transient and harmless and only once recurred. Also it was usually followed by recession of the enlarged nodes, leaving a normal radiograph (13 of 15). Only 2 patients with erythema nodosum developed pulmonary infiltration, and in them it was transient. Uveitis (12 of 66), almost as common as erythema nodosum, was much more important because of the early dangers to vision and the liability to recurrence or to chronicity. Though it healed eventually, 2 patients required systemic treatment with cortisone and antituberculous drugs before it was brought under control. The fate of extrapulmonary sarcoidosis when the hilar nodes regressed was variable. In more than half of these patients lesions of the skin, salivary glands, or eyes either cleared or became inactive by the time the chest radiograph was normal (9 of 16). In the others lesions of the uveal tract or of the conjunctiva persisted: 2 still had an active iritis a year and two years after the hilar nodes became normal, and 4

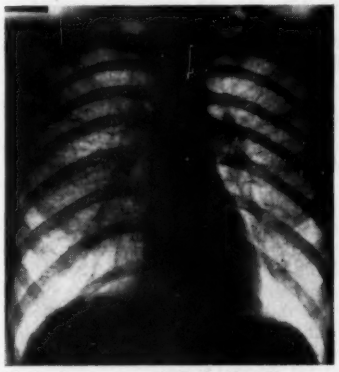

Fig. 7—Same case as in fig. 2: first discovery (in February, 1953) of bilateral pulmonary reticulation and diminution in size of hilar nodes.

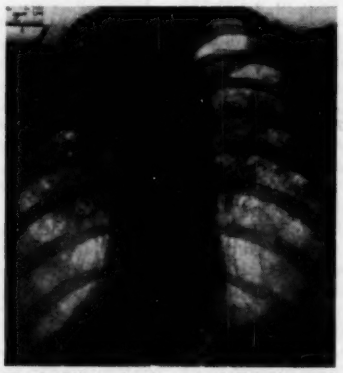

Fig. 8—Bilateral pulmonary infiltration and fibrosis nine years after discovery of sarcoidosis of hilar nodes in woman aged 44.

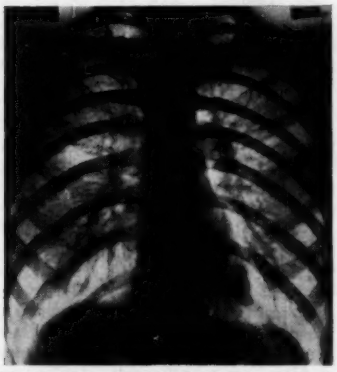

Fig. 9—Same case as in fig. 2: normal radiograph in August, 1953, which has remained normal for three years since then.

had a positive conjunctival biopsy up to a year afterwards.

Apart from ocular complications the clinical course was surprisingly uneventful. Of the 66 patients 60 kept well and continue to lead normal lives. The 6 others became dyspnœic because of diffuse pulmonary sarcoidosis which did not resolve. 3 were left eventually with extensive fibrosis and considerable lung failure. 1 of these also developed pulmonary tuberculosis as a late complication, with cavities and with *M. tuberculosis* in her sputum. She died of cor pulmonale a year later, sixteen years after the discovery of her enlarged hilar nodes.

Discussion

The size of the present series emphasises the importance of sarcoidosis as a cause of bilateral enlargement of hilar lymph-nodes, although its relative frequency is not known. Löfgren (1953) found 70 examples, of which 10 had parenchymal lesions also, by routine radiography of 420,000 people aged more than 15. The incidence was 0·05% in women and 0·03% in men; in the age-group 25–30 it was 0·11% and 0·08% respectively. Löfgren thought that this incidence suggested that a comparatively large proportion of adults in Stockholm had once had this form of sarcoidosis. Further records of this kind are needed because many examples are bound to be overlooked except in population groups undergoing serial radiography. In our series only erythema nodosum (15 of 66) and uveitis (12 of 66) were at all common as clinical guides. Their importance in this respect is now recognised.

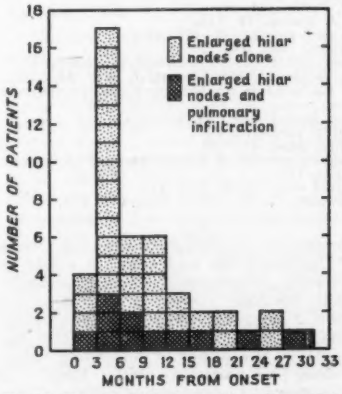

Fig. 10—Duration of abnormal radiograph in 45 patients.

That sarcoidosis of hilar nodes affects mainly young adults in this country as in Sweden is confirmed by this investigation, especially for the age-group 25–30, as found by Löfgren and Lundbäck (1952). Social factors do not appear to contribute to its prevalence; nor does a family history of the disorder. In our series sensitivity to tuberculin was low or absent in nearly two-thirds. In contrast, however, there was an apparently high rate of contact with tuberculosis (29 of 60). Since no control series is available, it is impossible to draw firm conclusions from this finding. However, it differs so widely from the contact-rate of 8·2% in controls in the Prophit survey (Daniels et al. 1948) that we feel it may indicate a link between exposure to *M. tuberculosis* and the development of sarcoidosis, especially because in more than half of our contact group exposure occurred within a year of the discovery of their sarcoidosis.

Nodal enlargement due to sarcoidosis is remarkably uniform radiologically and is probably rapid and quickly reaches a peak, because further enlargement is so rarely seen after the initial radiograph (7 of 66). It is rarely massive and is usually roughly symmetrical. The outer border of the nodal shadow is well defined, unless there are lesions in the lungs, an important point in recognising parenchymal changes, either infiltration or fibrosis, in the proximity of the lung roots. All the anatomical groups of lymph-nodes in the hilar region tend to be involved, in particular those situated at the major divisions of the main bronchi. Compression of bronchi was seen only occasionally in this series (figs. 3 and 5), and Turiaf and Brun (1955) found it in but 2 of their 41 cases. Complete occlusion of a segmental bronchus leading to collapse was

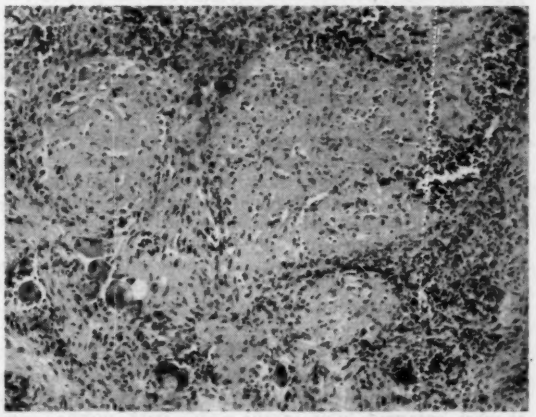

Fig. 11—Section of hilar lymph-node, showing hyalinised epithelioid-cell follicles, in a man, aged 31, who died of pulmonary sarcoidosis. (Hæmatoxylin and eosin. × 102.)

not observed. We have seen it only once, in a patient who had extensive pulmonary sarcoidosis.

The place of enlargement of hilar nodes in the natural history of sarcoidosis has been uncertain. In part this is due to the rarity with which sarcoidosis has been detected in the past except in exotic forms, until radiographic surveys brought to light this much more common stage. Also it is due to the potential chronicity of sarcoidosis and the difficulty of keeping a large enough group of patients under lengthy supervision. Only rarely is it possible to date the onset or even to estimate the duration of sarcoidosis before it is first detected; but there are none the less good reasons for believing that enlargement of hilar nodes is an early feature. In nearly a third of the present series it was followed by recognisable infiltration in the lungs. No instance of recurrent enlargement was seen; nor, in the remainder of our series (83 patients), have large hilar nodes ever appeared after pulmonary infiltration, whether persistent or not. These observations show that enlargement of the hilar nodes typifies the onset of sarcoidosis. But there is also evidence of widespread epithelioid-cell proliferation about this time. Of our 66 patients 22 had other clinical evidence of sarcoidosis when first seen, and 22 had follicles in the liver. Moreover in 9 of the 21 patients who had pulmonary infiltration this appeared within six months of observation. Löfgren (1953) found similar evidence.

The most important features of the course of hilar-node sarcoidosis were the high rate of remission and the fitness of the patients: 45 of the 66 patients achieved a normal radiograph and remained well. The rate of clearing of a comparable group in Löfgren's (1953) series was 87%. Neither the occurrence of erythema nodosum nor that of uveitis appeared to affect the prospect. Usually the nodes shrank rapidly and were within normal limits in three to six months from the time the first change was detected. Their recession was complete within a year in 26 of the 33 who did not develop pulmonary infiltration. For the small group of 12 with pulmonary infiltration as well as enlarged nodes which resolved it was complete within a year in 7. Thus the radiological changes regressed within a year in two-thirds of the 45 patients achieving a normal radiograph or in half the entire series. The longest was thirty-one months, but only 7 patients took longer than eighteen months (fig. 10). On the other hand, nodes persisting for two years or more may remit occasionally. After this, however, they are likely to remain: 3 examples in this series persisted unchanged from two to nine years without causing symptoms. Necropsies, of which we have had 6, including 1 from the present series, where such nodes have been found, show that the nodes undergo hyaline fibrosis (fig. 11).

About a third of the patients in this series (21 of 66) developed infiltration in the lungs. It appeared during the first year of observation except in 5. Although 9 of these 21 patients retained their pulmonary lesions, these were progressive in 3 only and then led to severe fibrosis and disablement. 1 patient died. In 12 of the 21 the infiltration resolved, in 9 within eighteen months. Pulmonary lesions which persist for longer are unlikely to resolve. The outlook then becomes uncertain because it is impossible to predict when progressive pulmonary sarcoidosis and eventual lung failure will develop. These patients, and more especially those with ocular complications which threaten sight, are those who most often require treatment. The management of the others should be to avoid restrictions and ensure periodic supervision.

Summary

The features and natural history of sarcoidosis are described in 66 patients whose chest radiographs initially showed enlarged hilar lymph-nodes with normal lung fields. Evidence of generalised sarcoidosis at this early stage was found clinically in 22 of the 66 patients and by liver biopsy in 22. The condition was commonest in young adults of either sex, and an unusually high rate of contact with tuberculosis was noted (48%). Erythema nodosum (13 patients) and uveitis (9 patients), often with a short febrile illness, sometimes heralded the onset, but this was often symptomless and discovered by routine radiography.

The enlargement of the hilar nodes was characteristic: bilateral, moderate, roughly symmetrical, and with a sharp lobulated outer border. The right paratracheal node was affected in about half the cases. Calcification never appeared. In two-thirds the lung fields remained normal, and the enlargement of the nodes regressed in 33 of 45 and never recurred. Pulmonary infiltration appeared in the remaining third (21 in 66), and 12 of these achieved a normal radiograph. Of the 66 patients in the series 45 had a normal radiograph eventually, usually within a year of coming under observation. Progressive pulmonary fibrosis developed in 3 patients only. Most patients kept well and led normal lives.

Bilateral enlargement of the hilar lymph-nodes is characteristic of early sarcoidosis, is harmless in itself, and has an excellent prognosis. Treatment is required only for some associated lesions, of which uveitis and persistent pulmonary infiltration are the most important.

We wish to thank the many colleagues who referred patients to us, in particular Dr. R. S. Bruce Pearson, Dr. J. L. Livingstone, Dr. J. M. Morgan, Dr. H. Nicholson, Dr. G. I. Rees Jones, Dr. K. Robson, and Mr. L. H. Savin. We are grateful to Dr. J. Blewett and Dr. D. Toye for radiographic assistance; Mr. R. Crick for the ophthalmic records; Mr. A. G. Ellerker for help with the tables; Mr. W. Smith and Mr. G. Harwood for photographs, and the ward Sisters who looked after the patients. We are especially indebted to Dr. Robert Coope and Dr. V. H. Springett for their most helpful advice and criticism.

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"If one could single out one concept more important than others in thinking of University life and work, it would be wholeness, unity in diversity, or synthesis as against analysis, building up rather than breaking down. I am taking for granted the usual virtues of integrity, industry, inventiveness, insight and all the rest. I would hope that all within the University sphere would feel the power of something bigger than themselves, and their own particular work; know that there are many valid routes to understanding reality; that the different approaches and differing conclusions all have something to add. The man of science takes one path, the artist, the poet and the writer take others. The man of feeling, the man who loves music at Belmont, the man who cultivates the numinous sense of reality, and the man of action, all have something valuable to say. I think the only real tests are sincerity, and humility of approach, and that with these we all feel at one. The more we can appreciate the work of others the deeper will be our insight, and the more fruitful will be the cross fertilisations. The immortal moment when the Professor of Chemistry at Glasgow University (I like to think it was during a dull Professorial Board meeting) drew the attention of his surgical colleague, Joseph Lister, to certain papers of the French Pasteur on 'Fermentation'—and so in due course brought down the walls of hospital sepsis and wound fever—is one which should set the pattern for University life."—DOUGLAS ROBB, F.R.C.S., *University Development in Auckland*. Auckland, 1957; p. 56.

EXPERIMENTAL FOOD-POISONING BY CLOSTRIDIUM WELCHII

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As a cause of food-poisoning *Clostridium welchii* has been suspected since the end of the 19th century (Klein 1895) but has attracted attention mainly in recent years. Outbreaks of a relatively mild transient diarrhœal illness attributed to this organism have been reported in Europe and the United States, and a comprehensive account of its problems has been published by Hobbs et al. (1953). The causal organism is considered to be a feebly toxigenic type-A *Cl. welchii* whose spores are more heat-resistant than those of other type-A strains. Spores present on meat may survive ordinary cooking and subsequently germinate if conditions are suitable.

The causal rôle of *Cl. welchii* cannot, however, be regarded as proved, for feeding experiments on human volunteers have given conflicting results. Österling (1952) and Hobbs et al. (1953) fed volunteers with cultures of different strains and obtained positive results, but the experiments were on too small a scale to offer statistical proof; on the other hand, Dack et al. (1954) tested four strains on 32 people with entirely negative results. Cravitz and Gillmore (1946) administered heated culture filtrates and produced symptoms, but these were unlike the symptoms observed in the outbreaks.

In view of these discrepancies we agreed with the view of Dack (1956) that further information is needed to explain the rôle of *Cl. welchii* in outbreaks of food-poisoning.

Materials and Methods

Strains Used

Three strains of heat-resistant type-A *Cl. welchii* were used; they were isolated in food-poisoning outbreaks by Dr. Betty Hobbs and kindly supplied by her.

Cultures in Robertson's cooked-meat medium were used in most of the experiments, in 18–22 ml. amounts in 1-oz. screw-capped bottles, which were incubated tightly capped. Other cultures were prepared in nutrient broth or in 2% glucose broth, freshly boiled and cooled, and were incubated in a McIntosh and Fildes jar, or in air after the addition of a heated iron strip. An incubation period of 18–22 hours at 37°C was used throughout.

Counts of the viable bacteria in freshly shaken cultures or suspensions were made by the method of Miles et al. (1938). The number of organisms attached to the meat particles was estimated after a washing-off process, and the result suggested that the concentration of organisms in the meat was about half that in the broth. This figure was used in calculating the bacterial content of whole Robertson's cultures.

Feeding Tests

The volunteers were 41 healthy adults aged 20–50, mainly medical students and medical staff. The preparations were generally added to the soup course of an ordinary luncheon. About six tests were done at a time, and controls consisting of sterile Robertson's medium were included, the subjects being kept in ignorance of the nature of the preparation they were receiving. After the meal they continued their normal activities and recorded any symptoms on a questionnaire form. Certain unlikely symptoms were included, among those tabulated, to test the suggestibility of the volunteers. Where indicated, serial experiments were made on the same volunteers, to compare directly the effects of different preparations. Most of the subjects were tested more than once, a few up to four or five times.

Examination of Stools for Heat-resistant Cl. welchii Spores

The organisms were isolated from the stools by making use of the heat-resistance of the spores (Hobbs et al. 1953): a small bottle of liquid medium was inoculated with a piece of fæces about the size of a pea and immersed in boiling water for an hour; a heated iron strip was then introduced, and incubation was carried out for not less than three days. The media adopted were ordinary nutrient broth and litmus milk, which were found to give similar results. Identification was made by the lecithovitellin reaction, with inhibition by *Cl. welchii* alpha antitoxin, and the Hobbs provisional serological types of isolated strains were ascertained by slide agglutination.

Experimental Findings

Strain 2985/50 (Hobbs Serological Type 1: N.C.T.C. no. 8797)

The results are summarised in table I. Twenty-four volunteers were fed with Robertson's cultures—some with whole cultures, others with the supernatant fluid, containing organisms, decanted from the meat. Within 2 days all but three had one or more of the following symptoms: diarrhœa, abdominal pain or discomfort, and nausea or anorexia. In fifteen control tests (sterile Robertson's medium) only two subjects had symptoms, and these were trivial. The difference between the two groups is statistically highly significant ($P = < 0.01$).

Syndrome of experimental disease.—The symptoms are analysed in table II and compared with those in the naturally occurring food-poisoning outbreaks described by Hobbs et al. (1953). In both, the predominant symptoms were diarrhœa and colicky abdominal pain or discomfort, though a few people in the experimental group had only diarrhœa or abdominal discomfort. The stools were loose or watery, with no blood. The incubation period varied from 5 to 21 hours, with only one exception: in this instance there was a symptom-free gap of 32 hours followed by vomiting for 24 hours without diarrhœa. It seems unlikely that these symptoms could have been connected with the test. A few subjects had nausea, anorexia, or slight headache in addition to diarrhœa. There were no symptoms to suggest pyrexia but some of the subjects felt a little unwell on the day following the feed; the illness was generally mild though it was sometimes uncomfortable and occasioned loss of sleep; it was usually over within 24 hours of the feed and did not prevent attendance at duties. The two volunteers who had symptoms following control feeds had only slight abdominal discomfort with flatulence, or

TABLE I—FEEDING TESTS WITH *Cl. welchii* (STRAIN 2985/50) CULTURES

Feed	Dose of viable organisms		No. taking part	No. with symptoms
	Range	Mean		
Whole Robertson's cultures 18–22 ml.	$5{\cdot}1 \times 10^8$ to $3 \times 10^{9*}$	$1{\cdot}3 \times 10^9$	18	16
Broth fraction of Robertson's cultures, 12·5–16 ml.	$7{\cdot}4 \times 10^8$ to $1{\cdot}3 \times 10^9$	$9{\cdot}8 \times 10^8$	6	5
Total	$5{\cdot}1 \times 10^8$ to 3×10^9	$1{\cdot}2 \times 10^9$	24	21
Controls (20 ml. sterile Robertson's medium) ..	Nil	Nil	15	2

* 15 cultures examined. $P = < 0{\cdot}01$.

TABLE II—SYMPTOMS IN FEEDING TESTS (*Cl. welchii* STRAIN 2985/50 CULTURES)

Symptoms	Experimental disease (24 volunteers)	Controls (15 volunteers)	Food-poisoning outbreaks (Hobbs et al. 1953)
Incubation period (hr.) ..	5–21 (average 12)*	3 and 6	6–22
Diarrhœa	17 (71%)	0	Main feature
Abdominal pain or discomfort	17 (71%)	2†	Main feature
Number of stools	1–9	0	..
Nausea or anorexia without vomiting	2	0	Rare
Vomiting	1	0	Rare
Headache	3	0	Seldom
Symptoms of pyrexia ..	0	0	Seldom
Duration of symptoms (hr.)	1/2–21 (average 7)	3	<24
No symptoms	3	13	Variable numbers

* With one exception of 32 hr.
† Slight discomfort and flatulence (1 volunteer) and abdominal rumblings (1 volunteer).

abdominal rumblings; neither had diarrhœa. Since diarrhœa appeared to be the cardinal symptom, we decided to use it as the sole indication of a positive result in subsequent experiments.

Strain 281/50 (Hobbs Serological Type 2: N.C.T.C., no. 8238)

Two subjects were fed with Robertson's cooked-meat cultures of this strain (dose 18 ml.—$8{\cdot}5\times10^8$ viable organisms): one had 2 loose stools 11 hours after the feed, and the other had no symptoms. The result suggests that this strain can cause food-poisoning; but, in view of the need to economise in the use of volunteers, no further tests with it were undertaken.

Strain 3653/50 (Hobbs Serological Type 3: N.C.T.C. no. 8239)

Six volunteers were fed with Robertson's cooked-meat cultures of this strain, as in previous experiments (table III). One complained of abdominal fullness and rumblings with dizziness 9 hours after the feed but nothing else, and the others were symptom-free. The same six volunteers were retested for susceptibility at a later date with live preparations of the active strain 2985/50, and three had diarrhœa. The difference between the results is not statistically significant but suggests that all strains may not be equally active.

Investigations of Nature of Disease

The strain of organism used in all the subsequent experiments was no. 2985/50, which we had shown to be active. As stated before, diarrhœa was accepted as the indication of a positive effect.

Effects of Filtrates

Bacterium-free filtrates were prepared from the pooled broth-fraction of several Robertson's cooked-meat cultures by filtration through gradocol membranes (A.P.D. 0·7 μ) after preliminary centrifugation. The filtrates were tested for sterility and stored before use for up to 5 days at −60°C. Three different batches were used in doses of 10 and 20 ml. (table IV). None of the six volunteers had diarrhœa; one had anorexia, nausea, and colic for 24 hours after the feed, but it later appeared that he was incubating an unrelated illness. A second had abdominal pain an hour after the feed but no other symptoms. The rest had no symptoms. Each was later tested with a preparation containing live organisms, and four had diarrhœa. The difference in the results is significant (P=0·03). Thus it is not possible to ascribe the disease to a preformed exotoxin.

TABLE III—FEEDING TESTS WITH *Cl. welchii*: COMPARISON OF STRAIN 3653/50 WITH STRAIN 2985/50 (6 volunteers)

Strain	Feed	Dose of viable organisms		No. with diarrhœa	No. without diarrhœa
		Range	Mean		
3653/50	Robertson's cultures 18 ml.	$1{\cdot}4$ to $2{\cdot}8\times10^9$	$2{\cdot}3\times10^9$	0	6
2985/50	Subsequent tests on same volunteers*	$7{\cdot}4\times10^8$ to $2{\cdot}5\times10^9$	$1{\cdot}5\times10^9$	3	3

P = > 0·05.
* 22 ml. Robertson's cultures (4 volunteers), 13·5 ml. broth from Robertson's culture (1 volunteer), bacterial suspension in water (1 volunteer).

Effects of Heated Cultures

Nine volunteers were fed with Robertson's cooked-meat cultures which had been immersed in boiling water for 10–15 minutes shortly before the meal. This treatment reduced the content of viable organisms to less than one hundred-thousandth of the original. None of the subjects had diarrhœa after the test; one had slight abdominal discomfort, one flatulence, and two slight headache during the ensuing 4 hours. Each volunteer was later tested with an unheated preparation, and this time five had typical symptoms, including diarrhœa. The difference between the two series of tests is significant (P=0·015).

Effects of Live Bacterial Suspensions

Bacterial suspensions were prepared from the broth fraction of Robertson's cultures, decanted from the meat or, in a few cases, from nutrient broth or 2% glucose-broth cultures, by centrifuging and resuspending the deposit in distilled water; more thorough washing was not attempted, lest the exposure to air should damage the organisms. The traces of original broth remaining in the suspension are unlikely to have been significant. Five volunteers were fed doses of $9{\cdot}6\times10^8$ to $1{\cdot}9\times10^9$ viable organisms (mean $1{\cdot}2\times10^9$), and three subsequently had diarrhœa; seven were given lower doses (3×10^7 to $4{\cdot}2\times10^8$, mean $1{\cdot}9\times10^8$), and of these only one had diarrhœa.

TABLE IV—FEEDING TESTS WITH *Cl. welchii* (STRAIN 2985/50) CULTURE FILTRATES

Feed	No. of viable organisms in culture from which prepared	No. taking part	No. with diarrhœa	No. without diarrhœa
Filtrate (batch 1) 10 ml.	$8{\cdot}1\times10^8$	2	0	2
Filtrate (batch 2) 20 ml.	$8{\cdot}8\times10^8$	3	0	3
Filtrate (batch 3) 20 ml.	$5{\cdot}8\times10^8$	1	0	1
Total filtrates	Mean $8{\cdot}1\times10^8$	6	0	6
Subsequent tests in same subjects with preparations of live organisms*	Viable dose ingested: 3×10^7 to $1{\cdot}5\times10^9$. Mean: $8{\cdot}8\times10^8$	6	4	2

P = 0·03.
* Whole Robertson's culture, 21–22 ml. (2 volunteers), broth fraction of Robertson's culture 15 ml. (1 volunteer), bacterial suspension in water (3 volunteers).

Since both bacterium-free filtrates and heated cultures proved inactive, in contrast to the effects of live bacterial suspensions and cultures, we were led to the conclusion that *Cl. welchii* food-poisoning is a mild transient infection, in the sense that a living agent is required.

Minimum Effective Dose of Organisms

The dosage used did not enable us to assess accurately the minimum number of organisms required to produce

TABLE V—STOOL EXAMINATIONS FOR HEAT-RESISTANT *Cl. welchii* SPORES (FROM VOLUNTEERS BEFORE AND AFTER INGESTION OF LIVE CULTURES OR SUSPENSIONS)

When material obtained	No. examined	No spores present	Spores present		Hobbs provisional serological type
Immediately before feed	26	20	6 (23%)		Various types present; all but one differed from type later administered
1–7 days after feed:					
Those with symptoms of food-poisoning ..	21	0	21	34 (97%)	All strains isolated identical with strain administered
Those with no symptoms of food-poisoning..	14	1	13		

symptoms. By comparing the results of tests with live cultures or suspensions of strain 2985/50 in thirty volunteers a rough indication was, however, obtained: when the dose of viable organisms was 5×10^8 or more, eighteen of twenty-six volunteers had diarrhœa (a proportion similar to that found among those at risk in several natural outbreaks), but with smaller doses only one out of seven was affected. The critical level therefore appears to be about 5×10^8 viable organisms.

Heat-resistant Spores in Stools

The results of stool examinations in thirty-five experiments are given in table v. The figures include all the available results from volunteers who had taken live cultures or suspensions of any of the three test strains but exclude a few cases where the presence of the spores was thought to be due to a preceding experiment. Spores were found to be present in the stools of 23% of those examined before the tests and in 97% after the tests. The latter figure includes those who had not developed symptoms.

A detailed investigation of the persistence of this organism in the stools was not undertaken. It was, however, found that in most cases a positive result appeared within 24 hours of the feed and apparently persisted for 6 days; from the 7th day negative results began to occur, but some positives were still obtained on the 14th day No specimens were examined more than 16 days after the feed.

A series of stools was also examined from fifty healthy people (this number including the volunteers before the tests) and eighty-five unselected hospital patients: the latter had various diarrhœal and non-diarrhœal conditions, and some were receiving antibiotics but none was suspected of having food-poisoning. The proportion of positives varied from 12% in patients with salmonella, shigella, and *Escherichia coli* enteritis, to 20% in the healthy, with an overall average of 15·6%.

The Hobbs provisional serological types of 22 strains found in controls were: type 1, three; type 2, three; type 3, one; type 4, two; type 8, three; not types 1–10, ten.

Serology

Hobbs et al. (1953) found traces of *Cl. welchii* alpha antitoxin in the blood of about half of a group of patients and staff at a hospital in which an outbreak of *Cl. welchii* food-poisoning had occurred. They implied that it would rarely be detectable in healthy people. The alpha-antitoxin titres in the serum were therefore studied in seven of the volunteers immediately before, and 12–19 days after, feeding tests in our series. The organism used was strain 2985/50, and six of the seven volunteers had diarrhœa; two of them were undergoing a second test (see below), and symptoms similar to those on the first occasion were experienced. In addition, five other volunteers were tested after feeding experiments. Sera from forty-seven unselected adults (emigrating from the British Isles and from Eastern Europe to the United States) were used as controls. The titrations were kindly performed by Dr. Harriet Warrack.

More than two-thirds of the control sera were found to contain small quantites of alpha antitoxin, the maximum being $^1/_{20}$ unit per ml. in two people. All the volunteers had levels within the normal range, and there was no significant difference between the results of titrations before and after feeding tests. A second attack of the disease was not more effective than the first in increasing the titre.

Immunity

Six volunteers who had already had a positive result in a first feeding test agreed to submit to a second, and in one case to a third, test. With one exception, they were again kept in ignorance of the nature of the test feed. In the intervals between these tests some of them had taken part in other experiments, in which doses insufficient to cause symptoms were ingested. A further attack occurred in every case, and usually the second attack was very similar to the first, both in pattern and severity, with only minor variations. Thus there was no indication that clinical immunity had developed.

Discussion

The experimental disease produced by feeding cultures of heat-resistant type-A *Cl. welchii* to human volunteers appears to resemble closely the naturally occurring disease. Knox and Macdonald (1943), McClung (1945), and Hobbs et al. (1953) have already emphasised that conditions highly suitable for the germination of heat-resistant *Cl. welchii* spores may occur in meat or gravy if kitchen hygiene is defective. "Precooking" of food for consumption the following day, combined with insufficient refrigeration in the interval, is particularly likely to give rise to these conditions, especially if the joints are large or the gravy is prepared in bulk; the meat maintains anaerobiosis. In these circumstances an environment suitable for the growth of *Cl. welchii* may be maintained for many hours. Probably therefore a portion of such food may contain numbers of live *Cl. welchii* as great as, or greater than, those administered in our experiments.

Furthermore, most people would not refuse to eat meals contaminated with these organisms since, as Hobbs et al. (1953) have stated, the affected food may not have any unpleasant taste or smell. In the present experiments many of the cultures did have an unpleasant smell or taste, but diluted in soup the preparations were usually not offensive; moreover sterile Robertson's medium, prepared from ox heart, had a distinct taste which was also somewhat unfamiliar. In only one batch was the odour strong, and this probably would have been rejected.

In the light of these facts and of the symptoms the identity of the natural and experimental diseases seems certain. Our results confirm and amplify those of Österling (1952) and Hobbs et al. (1953).

In previous reports the disease has been attributed to a variety of mechanisms. Cravitz and Gillmore (1946) ascribed it to a heat-stable enterotoxin, whereas Österling (1952) thought it was an infection. Hobbs et al. (1953) believed that a combination of living organisms and meat was responsible, whereas Dack (1947) thought that the symptoms might be due to mechanical distension caused by fermentation in the gut. The present negative findings with bacterium-free culture filtrates, given in volumes comparable to those of whole cultures known to be effective, make it unlikely that the illness is due to a preformed exotoxin. Although Cravitz and Gillmore pro-

duced nausea, cramp, and vomiting in six people fed with 75–100 ml. doses of heated culture filtrates, the onset occurred as early as 45–80 minutes after the feed, and only one person had diarrhœa. It is clear that the heated filtrates did not produce typical *Cl. welchii* food-poisoning.

The negative results with heated cultures and the positive results with live bacteria, whether in cultures or in suspensions, suggest two possible modes of action: either the living organisms multiply in the intestine, or an irritant effect is produced by a heat-labile endotoxin. The former is perhaps the more likely explanation. Whether the organism acts by producing an irritant in the lumen of the gut or by directly invading the intestinal wall cannot be answered at present. Hobbs et al. (1953) found that food-poisoning strains produce alpha toxin only in minute quantities, and the other major toxins of *Cl. welchii* are not demonstrable. The negative results in the tests with strain 3653/50 are of interest here. The toxin pattern of this organism was analysed at the time of isolation and at the time of our experiments, at the Wellcome Institute; the results were found to be typical of the heat-resistant type-A group, with only traces of alpha toxin on each occasion. No significant change took place over the years. There was no significant rise in titre of circulating alpha antitoxin in people tested with the active strain 2985/50. Although admittedly even a severe *Cl. welchii* infection may not cause a significant antitoxin response (Howie et al. 1953), the findings do not suggest that alpha toxin is responsible for the symptoms. It is, however, possible that they may be due to another, as yet unknown, exotoxin formed by the organism in the gut. The negative results might then be due to loss of toxigenicity in subculture, since this organism was originally thought to have caused food-poisoning, and was cultured in the laboratory for more than a year before being freeze-dried. The negative results of Dack et al. (1954) might well be due to the same cause.

The absence of clinical immunity after an attack is in keeping with other types of transient infection.

It is reasonable to suppose that the variation in susceptibility of the volunteers, which was apparent in the experiments, depends on the survival of the bacteria in the stomach. Hobbs et al. (1953) suggested that the meat in the cultures exerts a protective effect against the action of gastric juice; however, no positive evidence in favour of this view emerged from the present work, and if meat does have this effect it is unlikely to play a major part in the pathogenesis of the disease.

Examination of the stools for heat-resistant *Cl. welchii* spores partly confirmed the findings of Hobbs et al. (1953), who isolated them from 90% of their food-poisoning patients; in the present series 97% of the volunteers excreted the spores after the tests, including those who had not developed symptoms. In the controls, however, the proportion of positives varied from 12% in those with enteritis to 20% in healthy people (hospital staff and their families), giving an overall average of 15·6%. This is higher than in the control series of Hobbs et al. (1953), who found 15% of positives among elderly people in hospital but only 2% in healthy school-children and factory workers, the overall average being 5·2%. Our figures agree, however, with those of Hain (1949), who found that one-sixth of a series of patients and hospital staff in Hamburg excreted heat-resistant *Cl. welchii* spores. He thought that these spores were of *Cl. welchii* type F, but their low pathogenicity to guineapigs makes it more likely that they belonged to the heat-resistant type-A group. The reason for this divergence in the controls is not known; the only factor common to the groups with a high carriage-rate appears to be an association with hospitals, and perhaps the hospital environment is in some way conducive to the spread of this organism. The examination of further controls would be of interest. This point is of practical importance because the isolation of heat-resistant *Cl. welchii* from the stools is used as a means of diagnosis in outbreaks. This is clearly of value only if the proportion of positive results greatly exceeds that which might be found in a healthy population.

The inactivation of the cultures by heat shows that this type of food-poisoning might be prevented by boiling potentially affected food shortly before it is served. We do not of course suggest that this measure is a satisfactory alternative to good kitchen hygiene, but there may be circumstances when it should be used as a safety measure. It is important, however, that the food should be eaten very soon after boiling, for spores are often present and will germinate if given the opportunity.

Summary

Heat-resistant type-A *Clostridium welchii* food-poisoning was investigated experimentally by feeding human volunteers.

Cultures of a strain obtained originally from a food-poisoning outbreak produced in most of the volunteers a short attack of diarrhœa and abdominal pain after an incubation period of about 12 hours. The symptoms were identical with those in the naturally occurring outbreaks, and this is presented as evidence that heat-resistant *Cl. welchii* type A can cause food-poisoning.

A second strain gave indefinite results, while a third appeared to be inactive. This suggests that virulence may be lost, which may account for the negative findings of other workers.

Bacterium-free culture filtrates and cultures which had been heated to 100°C did not produce symptoms, but positive results occurred with live cultures and suspensions. It appears probable that the illness is due to a mild transient infection.

No significant rise in titre of circulating *Cl. welchii* alpha antitoxin could be demonstrated after an attack. *Cl. welchii* alpha toxin is unlikely to be concerned in the disease.

Heat-resistant *Cl. welchii* spores were found in the stools of 97% of the volunteers after the feeding tests; of the controls 15·6% excreted the organism. An apparent association between the hospital environment and a high carriage-rate was noted, but the explanation is obscure.

An attack did not confer protection against a further attack.

In circumstances where it is necessary to eat food that may contain *Cl. welchii*, infection is unlikely if it is boiled shortly before consumption.

We are much indebted to Dr. Betty C. Hobbs for valuable advice and suggestions as well as for bacterial strains and antisera; Dr. G. Harriet Warrack and her colleagues for the antitoxin titrations; and to Dr. J. Knowelden for guidance in planning the experiments and for the statistical assessment. Our particular thanks are due to the volunteers whose cheerful coöperation made this study possible.

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INTRADIAPHRAGMATIC COURSE OF THE LEFT PHRENIC NERVE IN RELATION TO DIAPHRAGMATIC INCISIONS*

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THE intramuscular course of nerves has had scant attention in the past from anatomists, but the needs of modern surgery demand that in certain situations further study be given to this part of their distribution.

Now that transdiaphragmatic operations are becoming increasingly frequent, the preservation of diaphragmatic function after incision of the diaphragm is of growing importance. Division of any of the branches of the phrenic nerve in the diaphragm is almost certain to be followed by permanent paralysis of the musculature innervated by those branches. In the early part of life satisfactory respiration can be maintained by a combination of costal and diaphragmatic movement, even though either mechanism may be in part deficient; but as age advances more and more reliance is placed on the diaphragmatic action. This fact is not always fully appreciated; and, although a nerve-dividing incision may be made in the diaphragm of a young person without any obvious respiratory embarrassment, the long-term view must be taken that later in life a respiratory deficiency may be aggravated by such an incision having been made.

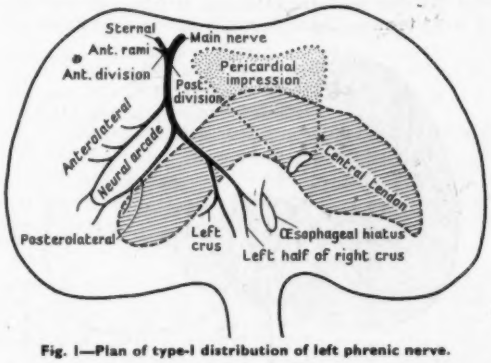

Fig. 1—Plan of type-I distribution of left phrenic nerve.

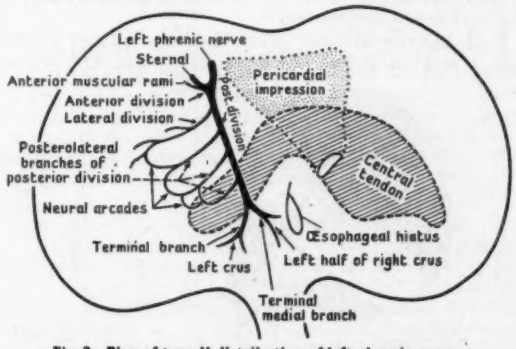

Fig. 2—Plan of type-II distribution of left phrenic nerve.

It may be necessary at any age to make in the diaphragm an incision of such a size that division of one of the main branches of the phrenic nerve is inevitable, and this must be accepted as a sacrifice necessitated to treat adequately and safely the condition for which the operation is being performed. An example of such a contingency would be an œsophago-gastrectomy for carcinoma or a stricture.

Nevertheless, for a simpler type of operation—e.g., hiatus hernia—consideration should be given to the use of an incision in the diaphragm which will cause the least possible loss of diaphragmatic function.

Previous Observations

Cavalie (1898) published a macroscopic and microscopic description of six adult human diaphragms. He concluded that, though the phrenic nerve supplied the larger portion of the diaphragm, the lower six intercostal nerves supplied the costal area of the diaphragm.

Felix (1922) gave a more complete anatomical description of the motor innervations of the diaphragm, which he said consisted of the phrenic nerve, the twelfth intercostal nerve, and probably sympathetic fibres. He assumed that the phrenic nerve supplied the main part of the diaphragm, the twelfth intercostal nerve the root of the diaphragm, and the sympathetic and phrenic fibres together the lumbar section of the diaphragm.

Schlaepfer (1926) claimed that the phrenic nerve is the only motor nerve to the diaphragm. Working on dogs, he showed a completely unilateral degeneration of muscle after division of the phrenic nerve. Two years after operation the diaphragm was completely fibrous on the paralysed side.

Strauss (1933) confirmed this in man and demonstrated, in a series of patients, complete muscular atrophy of the hemidiaphragm.

Leigh Collis et al. (1954) examined the diaphragm of fourteen cadavers and found that the nerve-supply to the left crus is wholly from the posterior division of the left phrenic nerve. The same nerve supplies the left half of the right crus.

Present Investigation

Twenty-four cadaveric specimens of human diaphragms were studied. Each was suspended in a wooden frame

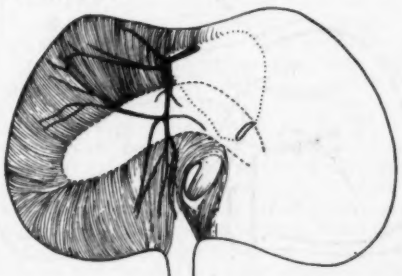

Fig. 3—Intradiaphragmatic course of left phrenic nerve on superior surface of left hemidiaphragm (type-I distribution).

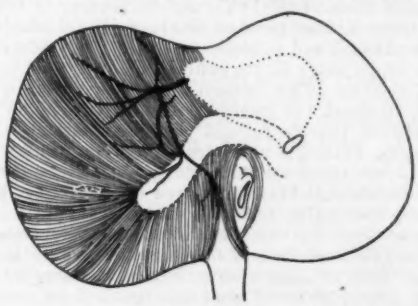

Fig. 4—As fig. 3.

* The substance of this paper was delivered before the Society of Thoracic Surgeons of Great Britain and Ireland in November, 1956.

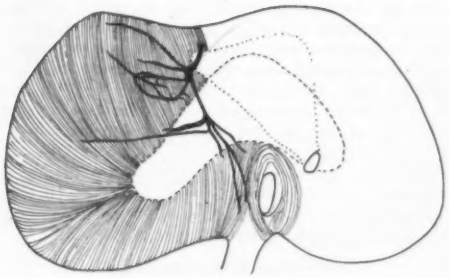

Fig. 5—As fig. 3.

and immersed in formalin. The formalised specimen was dissected on its superior (pleural) surface.

The pattern of the intradiaphragmatic course of the left phrenic nerve is arranged as two distinct types with slight variations in each (figs. 1 and 2).

Type I

This pattern was found in sixteen of the twenty-four dissections (figs. 1 and 3–5). The nerve divides into two main branches 0·5–2·0 cm. from the superior surface of the diaphragm, lateral to the left border of the heart and to the pericardial impression.

Each *anterior division* subdivides into a large sternal branch and one or two smaller lateral twigs. The sternal

Fig. 6—Intradiaphragmatic course of left phrenic nerve on superior surface of left hemidiaphragm (type-II distribution).

branch pierces the muscle-fibres after travelling for a centimetre or two, and gradually gets lost in the muscle fasciculi near the sternal attachment of the diaphragm. The smaller twigs from the anterior division supply adjacent muscle bundles.

The *posterior division* travels directly backwards for about a third of its length, lying under the pleura and superficial to the muscle-fibres. It burrows through the central tendon and then runs deep to the muscle-fibres of the left crus, where it divides like the limbs of a Y into its two terminal branches. The medial branch supplies the left half of the right crus after subdividing into two further branches. The lateral portion supplies the muscle-fibres of the left crus. On its way to the crus the posterior division gives off two main lateral branches—an anterolateral and a posterolateral. The anterolateral branch arises early in its course, before it reaches the central tendon. This branch travels transversely and laterally through the muscle fasciculi, lying about halfway between the pleural and peritoneal surfaces of the diaphragm. Its length varies from 3 to 8 cm., and it curves round to communicate with the posterolateral branch. This posterolateral branch is given off either just before the nerve disappears under the central tendon or during its course under the central tendon. It travels laterally for a variable distance and then turns anteriorly to communicate with the anterolateral branch, forming a neural arcade. Twigs given off from this arcade supply various amounts of muscle lateral to the arcade.

Type II

This pattern was found in eight of the twenty-four dissections (figs. 2, 6, and 7). The main nerve divides 0·5–2·0 cm. from the superior surface of the diaphragm into three main divisions—anterior, lateral, and posterior. The main nerve is again lateral to the left border of the heart and pericardial impression.

The *anterior division* has the same course and distribution as in type I, with a large sternal branch extending medially and forwards, and smaller anterior branches extending directly forwards and supplying the muscle fasciculi on the front of the diaphragm.

The *lateral division* corresponds to the anterolateral branch of type I but is given off more proximally, after the main trunk has travelled for only 0·5–1·0 cm. This nerve travels laterally and then curves posteriorly to communicate with the posterolateral nerve, which is a branch of the posterior division.

The *posterior division* runs the same course as in type I, ending in two terminal branches which supply the left crus and the left half of the right crus. Its distribution, however, differs, being characterised by the multiplicity of its branches. The first posterolateral branch is given off while the posterior division is still subpleural. This branch travels laterally and communicates with the lateral division to form a neural arcade. It also gives off a large terminal branch which curves posterolaterally

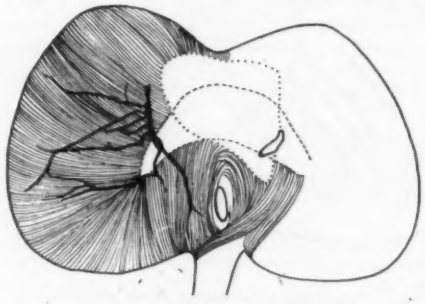

Fig. 7—As fig. 6.

to communicate with another posterolateral branch from the posterior division to form a second neural arcade.

The main posterior division gives off a variable number of posterolateral branches, each of which diminishes more in size the more posterior its origin. All these branches extend laterally and form a series of arcades by communicating with each other. These major and minor neural arcades supply twigs to all neighbouring muscle fasciculi.

Conclusion

Three possible incisions may be used to display the subdiaphragmatic structures with little loss of muscular function (fig. 8).

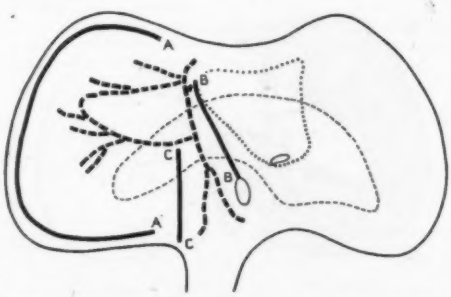

Fig. 8—Safe diaphragmatic incisions: A, circumferential; B, parapericardial; C, paracrural.

Circumferential incision.—Here, the diaphragm is divided close to its attachment to the chest wall. The full periphery may be divided and the left leaf turned upwards hinged on its pericardial attachment. This gives an excellent exposure of the upper abdomen, but the resuture is tedious, and it is doubtful if the repair would resist a much raised intra-abdominal tension following on the development of intestinal atony.

Parapericardial incision.—The incision is made close to the pericardial attachment medial to the posterior division of the nerve, running from the main phrenic nerve trunk posteriorly towards the œsophagus. This incision may be of value in exposing the upper surface of the left lobe of the liver, but it is of limited application.

Left paracrural incision.—The incision runs from the posterior attachment of the diaphragm, $^3/_4$ inch lateral to the œsophageal hiatus, directly forwards to the central tendon of the diaphragm. This incision is just lateral to the fibres of the left crus. This gives a good exposure of the fundus of the stomach and is adequate for exploration of the immediate upper abdomen and for the various manipulations and subdiaphragmatic suturing necessary in the reduction of a hiatus hernia. It has been successfully used in many cases now.

Summary

The distribution of the left phrenic nerve in the diaphragm follows two distinct patterns. In two-thirds there is a single major arcade from which multiple fibres arise, and in one-third there are multiple minor arcades providing the same distribution.

Three incisions in the diaphragm are suggested which avoid all major branches of the nerve. The left paracrural incision appears to have considerable practical use.

We wish to thank Miss Barbara Duckworth for the illustrations, and we are grateful to Prof. Charles Wells for his advice and help.

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TOXIC REACTIONS AFTER INTRAVENOUS IRON

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TOXIC reactions after intravenous saccharated iron oxide are well known, but it has not yet been possible to predict in which patients they will arise. Certain factors predispose to them, and recognition of these will enable some reactions to be avoided.

In 1947 Nissim described the low incidence of toxic effects of intravenous saccharated iron oxide, and its effectiveness in treating iron-deficiency anæmias was later established. The necessary injections are, however, time-consuming, sometimes difficult to give, and occasionally associated with alarming reactions. Nissim (1954) reviewed reports of these reactions, and added his own experience in 28 patients. It was hard to assess the predisposing factors because observations were based on small series of patients given variable doses and different preparations of saccharated iron oxide. I have therefore tried to discover which patients are liable to reactions by studying a large group treated with the same preparation —'Ferrivenin'—in a standard dose. This investigation is based on 802 treated patients whose anæmias were mostly associated with pregnancy, the puerperium, menorrhagia, gastro-intestinal hæmorrhage, rheumatoid arthritis, ulcerative colitis, and chronic nephritis. I saw over 420 of the patients, and in the remainder the information was obtained from the doctor giving the injections.

General Reactions

Character

The most prominent features of the reactions after injections were:

(1) Flushing and dizziness, followed by sweating, pallor, unconsciousness, fall of blood-pressure, and tachycardia (or rarely bradycardia).
(2) Dyspnœa, cyanosis, and constricting pain in the chest.
(3) Vomiting, diarrhœa, and abdominal pains which, if severe, might be accompanied by rigidity resembling a perforated ulcer, except that the gut sounds remained audible.
(4) Generalised aching pains of varying severity in the back, loins, limbs, head, and eyes.
(5) High temperature and rigors.

A few patients had reactions with features confined to one of these groups, but most had features from two or more groups with the emphasis on one. Cardiovascular and respiratory symptoms were acute and early, but other symptoms were more delayed and prolonged. With 100 mg. doses, most reactions were seen during the injection or within thirty minutes of its completion, a minority being delayed for up to three hours; they lasted usually from about a half to three hours, but occasionally for twenty-four hours. A given patient always had a similar reaction. All reactions subsided completely and no permanent effects were noted. 7 patients received courses totalling 2000–4000 mg. without ill effect. Over 10,000 injections of intravenous saccharated iron oxide have been given in this hospital without fatality. Patients with reactions were treated with rest, occasionally with sedatives including morphia, and intravenous noradrenaline if vasomotor collapse persisted.

Incidence

779 patients were treated with standard 100-mg. doses of intravenous saccharated iron oxide; most patients received a smaller initial dose of 25 or 50 mg., all subsequent doses being 100 mg. A total of 4818 injections was given. 58 (7·5%) of these patients had at least one toxic reaction (table I). In 28 the reactions were minor and treatment was continued, but in 30 the reactions were so severe that treatment was abandoned. The relation between the number of injections given and the onset of reactions was variable. 13 reacted to the first dose, 18 to the second, 22 to the third to fifth doses, 1 to the seventh and 1 to the eighth; 3 others had reactions to the first dose of a second course of injections. Patients having a minor reaction often received subsequent full doses without ill effect.

23 patients received large intravenous infusions of saccharated iron oxide (500–600 mg. in a pint of 5% dextrose) and 10 (43%) of these had reactions (table I).

TABLE I—INCIDENCE OF REACTIONS IN RELATION TO DOSE

No. of patients	No. of injections	Dose	No. of patients having reactions
779	4818	100 mg.	58 (7·5%)
23	32	500–600 mg.	10 (43%)

These were similar in character to those following a dose of 100 mg., but more severe, prolonged, and alarming. They began during the infusion or up to six hours later, and took up to forty-eight hours to subside.

Predisposing Factors

The incidence and character of reactions are influenced by several factors. The incidence varies with the cause of the anæmia (table II). Reactions are least common in the anæmias associated with pregnancy, the puerperium, menorrhagia, and gastro-intestinal hæmorrhage, and commonest in the anæmias associated with chronic infection, rheumatoid arthritis, ulcerative colitis, and

TABLE II—INCIDENCE OF REACTIONS IN RELATION TO THE CAUSE OF THE ANÆMIA

Cause of anæmia	Patients	Reactions	Incidence (%)
Pregnancy	344	18	5
Puerperium	74	4	5
Menorrhagia	50	3	6
Gastro-intestinal hæmorrhage	26	2	8
Simple iron-deficiency ..	140	12	9
Neoplasm	20	2	10
Chronic infections	19	2	11
Rheumatoid arthritis	23	3	13
Ulcerative colitis	22	4	18
Chronic nephritis	17	4	24
Others	44	4	9
	779	58	

chronic nephritis. In the latter two conditions reactions were twice as common in those patients with abnormalities of the plasma-proteins—either a low serum-albumin or an elevated serum-globulin.

3 patients with chronic bronchitis and emphysema, 2 out of 6 with mitral stenosis, and 1 with a severe kyphoscoliosis all developed similar respiratory distress after intravenous saccharated iron oxide. During the injection, or within five minutes of it, acute and alarming dyspnœa developed, with cyanosis and constricting pain in the chest which persisted for from fifteen minutes to about three hours. In 1 old lady with chronic bronchitis and emphysema, the reaction precipitated a relapse of congestive heart-failure. Similar reactions were not seen in other patients.

Backache, loin pain, and vomiting were particularly prominent in patients with renal disease and after massive infusions. Reactions seemed more frequent in the frail and elderly, though nothing was seen comparable to the sudden death of a man aged 69, reported by Barritt and Swain in 1953. Pregnant women were particularly prone to syncopal reactions. 38 of the patients who had reactions were closely questioned: they gave no history of asthma, urticaria, or sensitivity rashes.

Discussion

These observations suggest that reactions to intravenous saccharated iron oxide are related to such factors as dosage, the presence of pulmonary vascular disease, and the cause of the anæmia. Though the significance of the first of these is recognised and the second suspected, the third has not previously been recorded. Consideration of these points should enable some reactions to be avoided.

Dosage has an important influence on the incidence of reactions. With a dose of 100 mg. the incidence of reactions was 7·5%, but with a dose of 500 mg. the incidence was 43%. Ramsey (1950) also recorded a high incidence of reactions after large doses. It should be emphasised that it is the amount in a single injection that is important: with 100 mg. doses, there is no evidence to suggest that the incidence of reactions rises with the increase in the number of injections. Most reactions arise from the first 5 injections, and patients have received 2000–4000 mg. in divided doses without ill effect. The incidence of reactions is so high after massive infusions that they should not be given.

The association of reactions with lung disease has not been sufficiently emphasised. Reactions with acute respiratory distress have been observed in mitral stenosis, chronic bronchitis and emphysema, and severe kyphoscoliosis, and Librach (1953) reported similar reactions in a patient with pulmonary tuberculosis. Although respiratory symptoms have occasionally been noted in other patients, they have never been severe or prominent. This particular type of reaction resembles the clinical picture of pulmonary embolism, and there is experimental evidence to suggest that this is the mechanism.

Nissim and Robson (1949) have shown in mice that the injection of saccharated iron oxide is associated with the precipitation of iron particles particularly in the lung capillaries. It seems reasonable therefore to suggest that this occurs in man, and that symptoms arise particularly when the pulmonary capillary bed is damaged as happens in all the diseases mentioned. The clinical and experimental evidence suggests that greater care should be exercised in giving this substance to patients with disorders of the pulmomary capillary bed; doses must be smaller than usual (i.e., 25–50 mg.), and given particularly slowly. The loin pain noted after massive infusions and in patients with nephritis may similarly be due to renal emboli, for Ellis (1956) has shown, in rabbits given intravenous saccharated iron oxide, that iron precipitation causes renal damage.

Fewest reactions were seen in patients with pure iron-deficient anæmias—e.g., in pregnancy and the puerperium, and from chronic blood-loss (table II). Reactions were more common when iron-deficiency was accompanied by fever, toxæmia, or metabolic disturbances. This is further supported by the increased liability to reactions when the plasma-proteins were abnormal, as also happened in a case reported by Librach (1953).

The objection could be raised that some of these patients should not have received intravenous iron therapy. When, however, an element of iron-deficiency has been established as judged by the appearance of the red cells, the colour-index, and the mean corpuscular hæmoglobin concentration, this form of treatment has seemed justified after the failure of oral iron. It is noted that reactions are more common in those patients whose anæmias respond poorly to this type of treatment. Avoiding these reactions depends chiefly on correct selection of patients; iron deficiency must be clearly established. When there is chronic infection or nephritis, the injections should be of the order of 25–50 mg., and if these doses are tolerated, then the 100 mg. dose may be given. With the higher incidence of reactions in these anæmias and the variable response, alternative methods of treatment require more careful consideration.

The cause of reactions remains uncertain, but allergy and iron precipitation have been considered most likely. In this series the absence of an allergic background, and the absence of rashes, urticaria, and simple bronchospasm, suggest that allergy is not an important ætiological factor, though it may have been in earlier preparations containing impurities, particularly in the sucrose. Iron precipitation is the likely explanation for some early and most of the delayed reactions, but there remain reactions, particularly early ones, in which the ætiology is obscure. Nissim (1954) classified reactions into early and late, but with so much variation and overlap of symptoms this seems an oversimplification, and such a distinction should not be used for suggesting that early and late reactions have completely different ætiologies.

It seems that with the standard 100 mg. dose, about 5% of patients will continue to have reactions in spite of careful selection and slow injections. Reducing the dose is unsatisfactory from a practical aspect, since the number of injections needed is then increased. There is thus still a need for a less toxic iron preparation for parenteral use. The newer intramuscular iron ('Imferon') is perhaps an advance, but even this may result in toxic reactions (Ross 1955). Since intravenous saccharated iron oxide and intramuscular iron have been thought equally effective in the treatment of iron-deficiency anæmias (Cope et al. 1956) the assessment of their relative toxicity becomes particularly important.

Summary

802 anæmic patients treated with intravenous saccharated iron oxide were observed for toxic reactions. The reactions were related to the cardiovascular, respiratory, and gastro-intestinal systems and were accompanied by pains and fever. The overall incidence was 7·5% with

100 mg. doses and 43% with 500 mg. doses. Acute respiratory distress was seen only in patients with chronic lung disease and mitral stenosis. Reactions were least common (5%) in pure iron-deficiency anæmias, but when there was fever, toxæmia, or metabolic disturbance, the incidence increased to 24%. It is concluded that, with careful selection and the standard 100 mg. dose, the incidence of reactions will remain about 5%; hence the necessity for less toxic parenteral iron preparations.

I wish to thank Dr. Wallace Brigden and Dr. Adam Turnbull for their help, and those members of the staff of this hospital whose patients I have been permitted to see.

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Preliminary Communication

17-KETOSTEROIDS AFTER PREDNISONE AND PREDNISOLONE

THE metabolism of Δ^1-corticoids is still incompletely known. So far, we know that reduction of the A ring is not a main pathway of metabolism, because in all metabolites so far identified the djenone grouping was preserved.[1 2] Oxidation of the side-chain to the corresponding 17-ketosteroid generally follows the reduction of the A ring, so it is to be expected that 17-ketosteroid formation will be only a minor pathway of prednisone and prednisolone metabolism. To date, 17-ketosteroid excretion after administration of prednisone and prednisolone has not been thoroughly studied. The matter is complicated by the fact that these substances do not completely suppress the endogenous formation of 17-ketosteroids. Slaunwhite and Sandberg[3] found very low 17-ketosteroid excretion during prednisone treatment.

Recently we have had the opportunity to study the 17-ketosteroid excretion pattern in patients who had undergone bilateral ovariectomy and adrenalectomy on account of metastatising breast carcinoma. The patients were given prednisolone 80 mg. daily and the collected urines were extracted with benzene for 17-ketosteroid determination by the usual method. The dried extract was purified by girardisation. Total 17-ketosteroids were determined by the method of Holtorff-Koch on a suitable aliquot. The remainder of the extract was subjected to gradient elution chromatography on alumina. Less than 2% of the prednisolone administered could be recovered as 17-ketosteroid.

The chromatogram showed two main peaks of dinitrobenzene-reacting material. The fractions corresponding to each peak were pooled and evaporated to dryness. An aliquot of each residue was subjected to paper-chromatography in the systems toluol/cyclohexane (1/3) propyleneglycol, and heptane/propyleneglycol. The chromatograms revealed a steroid whose mobility was similar to that of Δ^1-adrenosterone and Δ^{1-4}-adrostadiene-11-β-ol-3-17-dione respectively, showing ultraviolet absorption (254 mμ source) without sodafluorescence and with positive dinitrobenzene reaction.

Recrystallisation of the residues from acetone and petroleum ether yielded colourless crystals whose melting-points were respectively 195–196 and 183–185°C. Finally, infra-red analysis revealed a spectrum identical with that of Δ^{1-4}-androstadiene-3-11-17-trione and Δ^{1-4}-androstadiene-11-β-ol-3-17-dione respectively.

Our results prove that 17-ketosteroid formation is only a minor pathway of prednisone and prednisolone metabolism, and offer additional evidence for the absence of tetrahydro-derivatives. The two 17-ketosteroids identified were present in only minor quantities (corresponding to less than 0·5% of the administered dose), suggesting again that the enzymatic systems converting the corticoids to 17-ketosteroids are largely inhibited by the presence of the dienone group.

The urinary metabolites of prednisone and prednisolone so far known represent only a small proportion of the administered dose, and we are still ignorant of what happens to the bulk of the administered dose.

The very low transformation of Δ^1-corticoids to 17-ketosteroids enables us to study the depression of the adrenal cortex by determining urinary 17-ketosteroids before and during prednisone treatment. This may be of value in the study of Cushing's syndrome for differentiation between adrenal hyperplasia and tumour.

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New Inventions

OUTPATIENT TREATMENT OF THE FRACTURED FEMORAL SHAFT IN CHILDREN

CONDITIONS in Ibadan will improve when the new teaching hospital opens; but at present beds are so scarce that children cannot be treated as inpatients unless they present some very serious pædiatric problem, and they have to be discharged as soon as possible.

The child with a fractured femur blocked a bed for 3–6 weeks, and often he was discharged in very unsatisfactory "1½-hip" spicas as soon as there was any radiological callus. We decided therefore to try a portable bed for gallows traction, as used (Dr. Ralph Hendrickse told me) in a South African hospital.

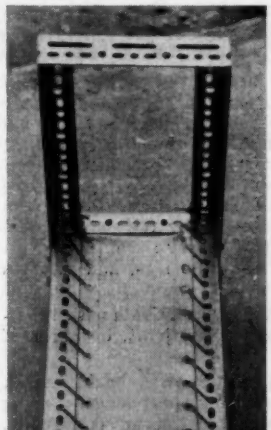

Fig. 1.

A prototype was made by the hospital maintenance staff from 'Dexian' light angled-steel (fig.1) the measurements being:

Bed frame ..	27 × 18 in.
Gallows standard	27 × 18 in.
Legs	9 in.

Other models were made to suit individual patients. For example:

For a child a month old:

Bed frame ..	18 × 9 in.
Gallows	18 × 9 in.

For children of 6–10 years:

Bed frame ..	30 × 18 in.
Gallows	30 × 18 in.

The bed-frame was completed by a piece of stretcher canvas, secured to the frame by standard cord lacing. In practice the dexian crosspiece was placed lower on the legs so that the buttocks could at no time touch metal.

The patient's legs are suspended from the gallows by skin-traction

using zinc-oxide strapping, after preparing the skin with tinct. benzoin co. The whole is reinforced with crêpe bandaging of the limb. Wooden tongue-spatulas are used as spreaders and traction units in the strapping at the ankles. The traction cords are then tied to the beam of the gallows (fig. 2). The patient is usually discharged in 48 hours if the home circumstances are satisfactory and if the parents can be made to understand the principle of the gallows bed. He is brought weekly by ambulance to the out-patient department for checking of the skin-traction, and for radiography every 3–4 weeks.

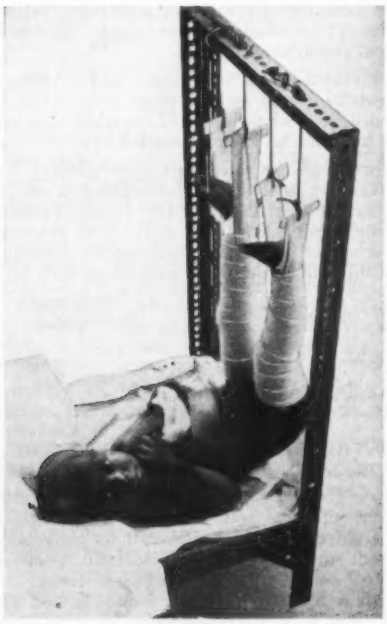

Fig. 2.

The traction cord chafed on the steel; but this was prevented by using rubber tubing (from old blood-transfusion sets) as a sleeve for the cords. Other difficulties arose from creeping of the skin-extension strapping, from the parents inserting a pillow under the buttocks and sacrum, and from the child getting hold of a knife and cutting himself down. In a total of 15 cases treated on the portable frame, no vascular complications due to traction have been seen.

Advantages of the method include the rapid return of the child to his home environment and parental care and responsibility, thus avoiding the frequent emotional upsets of visiting-hour. (This is particularly important in Ibadan where there is not yet a comprehensive catering service for all patients and the parents attend three times a day to feed the children.) Breast-fed infants can continue to be fed on demand by the mother, and not have to be weaned. Nursing is easy: a small bedpan or bowl can be pushed between the legs, and napkins can be easily changed.

This method has been used for inpatients with tuberculous or septic arthritis of the hip-joint, or burns of the perineum or thighs.

The dexian strip is easily cut with a hacksaw. A frame can be enlarged by inserting short lengths, using the tools from the average car-kit in an emergency. The unit is stable and easily transportable, and the same materials might be used for other purposes—e.g., frames for reduction of congenital dislocation of the hip.

I wish to thank Prof. Beatrice Joly, F.R.C.S., of this hospital, Ibadan, for her help and encouragement.

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Reviews of Books

Pulmonary Complications of Abdominal Surgery

A. R. ANSCOMBE, M.S., F.R.C.S., senior lecturer in surgery and honorary consultant, St. George's Hospital, London. London: Lloyd-Luke. 1957. Pp. 121. 20*s*.

IN producing a model review of his subject, Mr. Anscombe expresses himself clearly and concisely, presenting his facts and figures so that the reader can assess their significance for himself. Where the number of cases or controls is small, the fact is shown clearly and not glossed over to try and prove his point. The illustrations are simple and very clear.

The book begins with a short historical review and goes on to consider the incidence-rate over a very large number of carefully tabulated cases. The ætiology of the postoperative complications is a difficult subject and no doubt the various views will gradually become clearer as more experimental work is done. The description of the mechanism of breathing and its investigation is good; and the factors which influence the complications, preoperative, operative, and postoperative, are also well portrayed.

The big advances in anæsthesia and the use of antibiotics have led to the neglect of the simple mechanical effects, and only recently has it become common practice for a patient with a poor vital capacity to be examined by the anæsthetist as an outpatient, and to be admitted several days before operation so that the operative risk may be lessened by improving the mechanical efficiency of his chest. Those interested in physical medicine can do much to improve the mechanical function of the lungs both before and after operation, and this book will encourage them to do so.

Fundamentals of Clinical Neurophysiology

PAUL O. CHATFIELD, M.D., formerly chief, section of clinical neurophysiology, National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Maryland. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 392. 63*s*.

THE substance of this book might be better described if the word "clinical" were omitted from the title, for it is in fact a very useful introductory account of the present-day position in neurophysiology. Dr. Chatfield has substantially succeeded in his aim of presenting a one-man integrated view of the better-established facts of neurophysiology. There are occasional references to clinical observations, but for the most part he writes from the viewpoint of the laboratory worker. Clinicians interested in the experimental study of the nervous system will find this an informative book, and it will also be welcome to preclinical students seeking a readable survey of the neurological side of physiology.

The Treatment of Wound Shock

2nd ed. Medical Research Council Memorandum no. 34. London: H.M. Stationery Office. Pp. 39. 3*s*. 6*d*.

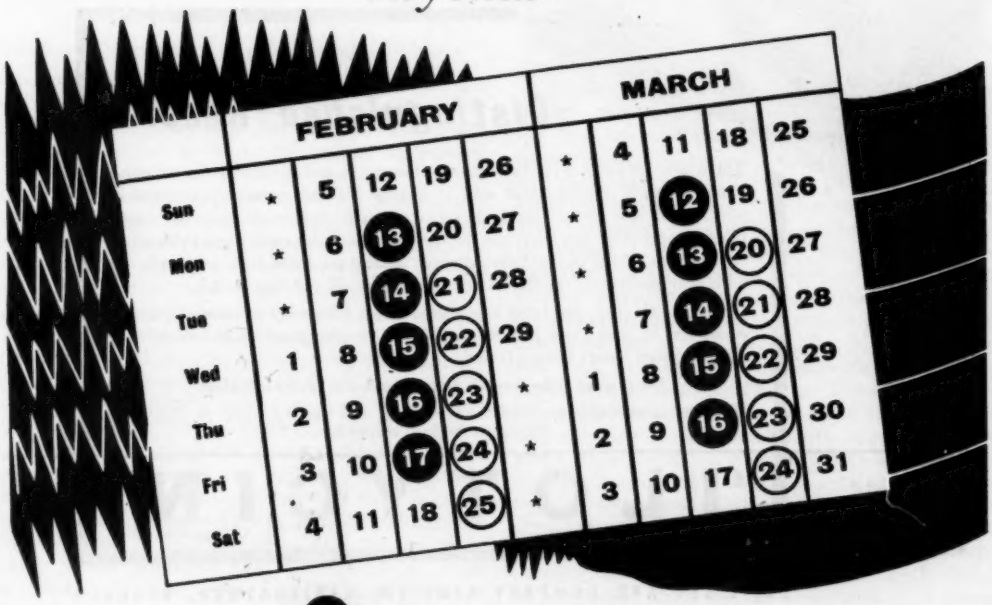
THIS memorandum, first issued during the late war, has been almost entirely rewritten by a working party specially appointed for the purpose. In days when severe accidental injuries seem to be increasing steadily and when massive surgical operations are commoner than ever, knowledge of how to treat severe shock is as important as it is in war-time; and this valuable memorandum is a welcome guide.

The terms used in the classification of the types and degree of shock are discussed in detail; and the memorandum gives an up-to-date description of methods of assessment of the acute effects of injury and the treatment of shock in various types of injury, including burns.

There are short sections on anæsthesia, postoperative treatment, fat embolism, and anuria. The five appendices deal with the fluids supplied by the British transfusion services, plasma substitutes, apparatus, and reactions, and also with a number of practical points concerning the intravenous administration of fluid.

The emphasis throughout is on the clinical appraisal and management of the injured patient.

● *Restoring the normal rhythm*



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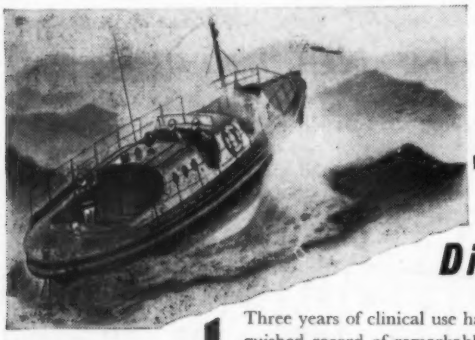

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THE LANCET

LONDON: SATURDAY, JULY 13, 1957

The Significance of High Blood-pressure

In recent years the problem of hypertension has been attacked with increasing vigour from many sides; but despite searching clinical, statistical, and experimental studies we are still unable to foretell with any certainty the results of increased blood-pressure in the individual patient. In the half-century since ALLBUTT first showed that hypertension could occur in the absence of renal disease the chief advances have been the recognition and separation of specific causes and forms of high blood-pressure. In particular, malignant hypertension has been defined as a fulminating disorder which may complicate any of the hypertensive diseases. Endocrine causes, such as Cushing's syndrome and phæochromocytoma of the adrenal medulla, are now clearly separated, and coarctation of the aorta is readily diagnosed. Chronic pyelonephritis and other less obvious forms of renal disease, sometimes affecting only one kidney, are regularly considered and occasionally discovered as the cause of hypertension. Nevertheless, these refinements of diagnosis are side-issues compared to the main problem, which concerns the significance of high blood-pressure in that great majority of patients who remain in the category of essential hypertension. As ALLBUTT made clear, this disorder is compatible with long life and freedom from serious disease; on the other hand, its complications may cause sudden death or lifelong invalidism. This dilemma of prognosis carries unfortunate social implications, for the blood-pressure is becoming an important factor in acceptance for life assurance and superannuation benefits, and indeed for entry into many occupations.

In our present issue this problem is forcibly stated by Dr. WILLIAM EVANS, who has long made a study of high blood-pressure and its manifestations in people of various ages. His thesis is that in both the young and the old high blood-pressure may follow a benign course for many years without giving rise to cardiovascular complications. This he would term "hypertonia" as distinct from "true arterial hypertension," which he associates with cardiovascular hypertrophy and which carries a grave prognosis, owing particularly to cardiac and cerebral arterial disease. This thesis is a restatement of the long-recognised fact that the serious manifestations of high blood-pressure are due to arterial degeneration, which is accelerated and aggravated by increased arterial strain. The crucial question is: Why do some patients with high blood-pressure develop arterial degeneration—whether this be the acute arteriolar necrosis of malignant hypertension, or the slowly evolving atheroma of so-called benign hypertension—whereas others do not? Clinical observation indicates (and Dr. EVANS's findings support this view) that cardiovascular hypertrophy and degeneration develop predominantly in patients whose blood-pressure, particularly the diastolic component, is sustained at a high level, while the more benign course is associated with a labile and intermittent hypertension, which may manifest itself under the stress of medical examination. For life assurance, only a single estimation of blood-pressure is usually made, and the resulting failure to distinguish between sustained hypertension and a labile blood-pressure reacts unfairly on many individuals. Yet it is difficult to see a solution, since the subsequent course of a labile blood-pressure is unpredictable. There is considerable evidence that the natural history of "hypertonia" and "true hypertension" are not so clearly distinguishable as Dr. EVANS suggests. In his own series, cardiac pain was present in almost half of the 50 older patients placed in the hypertonia group, and 9 died with cardiac infarction. The younger patients in this category—recruits for National Service—showed no evidence of cardiovascular disease after a ten-year follow-up, but a further period of observation is necessary before the development of sustained hypertension and its vascular complications can be excluded. An investigation of this kind by LEVY et al.[1] provided definite support for such a sequence of events. From examination of the medical records of more than 22,000 U.S. army officers over a period of from one to twenty-five years, they obtained evidence that sustained hypertension was commoner in those with previous transient hypertension than in those who have shown no previous elevation of blood-pressure. The rates of retirement and death from cardiovascular renal disease were also consistently higher among those with transient hypertension than in those without. A transition from intermittent to sustained hypertension is often seen in chronic renal disease. Recent clinical observations have provided contributory evidence of a different kind. In many hypertensive disorders it has been found that the blood-pressure may remain increased after the original cause has been removed. This may happen in patients with phæochromocytoma, Cushing's syndrome, coarctation of the aorta, or unilateral renal disease. Thus various forms of acute hypertension may give rise to sustained hypertension, the mechanism of which is different from that of the early phase. It seems justifiable to presume that a similar relationship may hold for the early and late stages of essential hypertension. The mechanism which sustains chronic hypertension is obscure. That this mechanism is generalised organic narrowing of the arteries is unlikely for several reasons, not the least of which is that if such changes are partly attributable to the severity and duration of the hypertension, as there is good reason to believe, they can hardly be named as the cause of the change from an intermittent to a sustained level.

It is essential, therefore, in assessing prognosis to keep an open mind about the relation between different grades of essential hypertension. While cardiovascular hypertrophy is directly proportional to the mechanical stresses produced by increased arterial pressure, degenerative changes in the heart and blood-vessels depend also on other factors, some of them metabolic, and for this reason atheroma shows an individual variation independent of the blood-

1. Levy, R. L., Hillman, C. C., Stroud, W. D., White, P. D. *J. Amer. med. Ass.* 1944, **126**, 829.

pressure level. The most striking example of this is the higher prevalence of vascular degenerative complications in men than in women with the same degree of hypertension. Many workers are investigating the ætiological aspects of atheroma, and until these are more clearly understood we should be in no hurry to accept new concepts or to change the terminology. Meanwhile practice would be improved and much injustice avoided if those who use the sphygmomanometer in routine medical examinations were to give more thought to the significance of a high blood-pressure reading. The distinction should at least be made between sustained hypertension and a temporary aberration from the normal. This can be readily done by repeated estimations, either in the course of a day or over a longer time, in conditions as free as possible from physical and emotional disturbance. In addition a search should always be made for the clinical and cardiographic signs which differentiate hypertensive cardiovacular disease from simple hypertension.

Amyotonia Congenita

THE infant with severe hypotonia and impaired movement of the limbs and often reduction of the tendon reflexes presents a difficult problem in diagnosis and prognosis. In 1900 OPPENHEIM [1] described briefly under the name of myatonia congenita infants who were severely hypotonic with reduced spontaneous movements but no actual muscle paralysis and with weakened or absent tendon-jerks. He suggested that this disorder was due to defective development of the muscles or of the peripheral motor neurones and that improvement occurred in the course of time. This condition, which became known as Oppenheim's disease or amyotonia congenita, has been the subject of controversy as to whether it is in fact a pathological entity. It soon became clear that many infants who were severely hypotonic in the first few weeks or months of life rapidly became worse and died, showing at necropsy degenerative changes in the anterior horn cells similar to those found in the infantile spinal muscular atrophy which had been described by WERDNIG [2] and by HOFFMANN.[3] In other infants, however, who early in life had shown a similar clinical picture of gross hypotonia the clinical course and the pathological findings were different. SILVESTRI [4] described 2 children with the clinical picture of amyotonia congenita in infancy in whom there was a family history of an aunt with progressive muscular dystrophy. When the elder of the affected children reached the age of 16 the hypotonia had disappeared, but he had the characteristic proximal-muscle wasting and weakness of the Erb type of progressive muscular dystrophy. BATTEN [5 6] maintained that the picture of amyotonia congenita could be caused by myopathy without involvement of the central or peripheral nervous system, and in 1914 SPILLER [7] concluded that the clinical picture of amyotonia congenita as described by OPPENHEIM could be caused by several different pathological processes. SPILLER's views have been confirmed by subsequent studies. Although in the majority of affected infants who died changes in the anterior-horn cells resembled those of the Werdnig-Hoffmann disease,[8 9] several carefully studied cases showed no pathological lesions in the spinal cord.[10–13] ALDREN TURNER [14] followed up a family of Batten's patients in which 5 members had shown the typical picture of amyotonia congenita in infancy, and in adult life no hypotonia but localised wasting and weakness of certain muscles, especially the sternomastoids and shoulder-girdle muscles. The disorder appeared to be non-progressive, and on clinical grounds ALDREN TURNER suggested that it was a congenital myopathy. This was subsequently confirmed [15] when 1 of the patients died of bacterial endocarditis and no abnormality was found in the central nervous system on thorough examination, while sections of affected muscles showed changes resembling those in myopathic muscles.

In the past few years follow-up studies of children who showed the clinical syndrome of amyotonia congenita in infancy have been carried out in Denmark by BRANDT [16 17] and in England by WALTON.[18–20] BRANDT studied 131 children who had muscular hypotonia and weakness beginning at birth or in the first year of life. He found that 87 probably had progressive spinal muscular atrophy (Werdnig-Hoffmann), and in 28 the hypotonia was symptomatic of various conditions such as mental deficiency, cerebral diplegia, or nutritional or metabolic disorders such as rickets. There were 13 other patients, of whom 6 recovered apparently completely, 3 improved strikingly, 3 improved but remained disabled, and 1 died of pneumonia after improving somewhat. BRANDT thought that these cases were a heterogeneous group, but that at least 3 resembled the congenital non-progressive myopathy originally described by BATTEN. WALTON's series was of 109 patients in whom amyotonia congenita had been diagnosed in early childhood. The follow-up showed that 67 had infantile spinal muscular atrophy of which the prognosis was bad; 55 died between the ages of 5 weeks and 12 years, while the 12 survivors were all severely disabled, the eldest being aged 20. There were 3 cases of progressive muscular dystrophy and 1 of polymyositis, and in 20 cases the hypotonia was symptomatic of various conditions such as mental deficiency and cerebral diplegia. (Infantile polyneuritis as a cause of the syndrome, although not encountered by WALTON, has been recorded.[21]) The remaining 17 patients in WALTON's series were of particular importance. They were all limp, floppy children who showed considerable delay in reaching the milestones indicating increasing muscular activity; but as they got older they all improved, 8 recovering completely between the ages of 5 and 15 years. In the other 9 the hypotonia gradually

1. Oppenheim, H. *Mschr. Psychiat. Neurol.* 1900, **8**, 232.
2. Werdnig, G. *Arch. Psychiat.* 1891, **22**, 437.
3. Hoffmann, J. *Disch. Z. Nervenkr.* 1893, **10**, 292.
4. Silvestri, T. *Gazz. Osp. Milano*, 1909, **30**, 577.
5. Batten, F. E. *Quart. J. Med.* 1909, **3**, 313.
6. Batten, F. E. *Proc. R. Soc. Med.* (*Sect. Neurol.*) 1914, **8**, 69.
7. Spiller, W. G. *Brain*, 1914, **36**, 75.
8. Greenfield, J. G., Stern, R. O. *Ibid*, 1927, **50**, 652.
9. De Lange, C. *Acta pædiat., Stockh.* 1937, **20**, suppl. 3.
10. Councilman, T., Dunn, C. H. *Amer. J. Dis. Child.* 1911, **2**, 340.
11. Haushalter, P. *Arch. Méd. Enf.* 1920, **23**, 133.
12. Silberberg, M. *Virchows Arch.* 1923, **242**, 42.
13. Menges, O. *Disch. Z. Nervenheilk.* 1931, **121**, 240.
14. Aldren Turner, J. W. *Brain*, 1940, **63**, 163.
15. Aldren Turner, J. W. *Ibid*, 1949, **72**, 25.
16. Brandt, S. *J. Child Psychiat.* 1948, **1**, 266.
17. Brandt, S. Werdnig-Hoffmann's Infantile Progressive Muscular Atrophy. Copenhagen, 1950.
18. Walton, J. N. *Lancet*, 1956, **i**, 1023.
19. Walton, J. N. *Proc. R. Soc. Med.* 1957, **50**, 301.
20. Walton, J. N. *J. Neurol. Neurosurg. Psychiat.* 1957, **20**, 144.
21. Chambers, R., MacDermot, V. *Lancet*, 1957, **i**, 397.

became less pronounced; but they had muscle wasting and weakness, particularly of the sterno-mastoids and muscles of the shoulder and hip girdles. It seems clear that these cases are similar clinically to those described by ALDREN TURNER as congenital myopathy; but WALTON calls them "benign congenital hypotonia" as, although electromyography in 5 of the cases suggested a myopathy, muscle biopsy was normal in the 6 cases where it was carried out. This nosological impasse may be ended when the refined methods of muscle biopsy and histology described by WOOLF and TILL [22] are applied to cases of this type, and studies on these lines have already started.[23] These studies amply confirm OPPENHEIM's view, expressed at the beginning of this century, that there is a group of severely hypotonic infants whose condition improves over the course of years and in whom there is no disease of the central nervous system.

Vesico-vaginal Fistula

SEVERAL recent papers [24–27] from different parts of the world demonstrate the changing ætiology of this "greatest misfortune that can happen to a woman, the more so because she is condemned to live with it and cannot hope to die from it." [28]

LAVERY [29] reports 160 cases from South Africa in all but 3 of which fistula was a direct consequence of protracted or neglected labour. Similarly MAHFOUZ's [26] huge series of over 900 urinary fistulæ in Egypt resulted mainly from obstetrical causes. In the United States and Great Britain, on the other hand, it seems that the number of cases following obstetrical neglect is declining, while the number due to gynæcological treatment (surgery or irradiation) is increasing. In EVERETT's [27] series, gynæcological causes exceeded obstetrical by five to one. The intractable fistulæ associated with radiotherapy for malignant disease in the pelvis often arise from avascular necrosis many years after the apparent cure of the original lesion; their treatment taxes the skill of the expert to the utmost. MOIR [25] found that 59% of his cases of fistula had followed pelvic surgery. Gynæcological operations are apt to result in fistulæ when the tissues are adherent to the urinary organs. It seems that most of these mishaps have followed ischæmic necrosis, due to either inclusion of a portion of the bladder or ureter in or near a suture, or pressure exerted by local œdema or hæmatoma. When trauma to the bladder or ureter is seen and repaired at once, subsequent urinary leakage is rare; but escape of urine will quickly follow if such damage passes unnoticed at operation. The operations chiefly concerned are total hysterectomy (notably by the abdominal route) and vaginal plastic procedures. In the latter the surgeon, concentrating on the region of the bladder-neck in his efforts to cure stress incontinence, may occasionally cause a very serious type of fistula. Too tight a suture at this site, especially if tied over an indwelling urethral catheter, can lead to sloughing of the urethra. Attempts at repair can be very disappointing; a perfect anatomical reconstruction has sometimes completely disappeared, within a few weeks of operation, because of inadequate blood-supply.

In treatment there is much to be said for the smallest operation that will cure the condition. MOIR [25] and RUSSELL [24] advocate careful removal of scar-tissue from the edges of the fistula until tiny bleeding-points in the freshened edge indicate that a reasonably vascular area has been reached, and closure in one or two layers. This technique, involving a minimum of dissection, is similar to that originally practised by SIMS [30] and EMMET. The more extensive flap-splitting technique used by MAHFOUZ [26] gives satisfactory results in favourable cases, but when much fibrosis and avascularity remain from previous unsuccessful attempts at repair (19 in a case of MOIR's) there is a danger of aggravating the disorder. The excellent results reported (95–99% successful closure) make an impressive contrast with the extreme pessimism prevailing when Sir JAMES YOUNG SIMPSON [31] wrote in 1872: "a urinary fistula is an infirmity which is beyond all relief or hope." That some are still unaware of what can be achieved is indicated by the occasional statement that transplantation of the ureters is necessary in a high proportion of cases. But difficult cases can be cured only by the most painstaking attention to detail—with careful assessment by cystoscopy, excretion urography, and, if necessary, examination under anæsthesia—before a plan of attack is selected. Such matters as posture on the operating-table, the choice of suture-materials, details of operative technique, and postoperative management must be considered anew in each case. The vaginal route is usually safer and surer than the transvesical or transperitoneal. Too often closure is attempted prematurely in an understandable anxiety to correct the fault as soon as possible. The tissues must be allowed to recover fully before reconstruction; most gynæcologists recommend that four to six months should be allowed to pass, though COLLINS [32] has reported success at an earlier stage by administering cortisone to reduce fibrosis. A good blood-supply to the area must be provided by one means or another. Many sources have been used, especially in post-irradiation fistulæ, including extensively mobilised bladder, bowel, and omentum; the bulbo-cavernosus muscle and adjacent tissue from beneath the labium majus [33]; skin-flaps from the labia minora [24]; and even the gracilis muscle brought through the obturator foramen.[34] The suture-line must not be subjected to excessive tension, and relieving incisions may be needed at the sides of the vagina. Good drainage must be maintained for seven to ten days after operation. Non-irritant sutures should be left in place for at least three weeks and should be removed with care; this is often best done in the operating-theatre under general anæsthesia.

Provided the tissues are elastic and have a good blood-supply, such operations are well within the scope of any surgeon skilled in standard vaginal plastic

22. Woolf, A. L., Till, K. *Proc. R. Soc. Med.* 1955, **48**, 189.
23. Woolf, A. L. *Ibid*, 1957, **50**, 307.
24. Russell, C. S. *J. Obstet. Gynæc., Brit. Emp.* 1956, **63**, 481.
25. Moir, J. C. *Amer. J. Obstet. Gynec.* 1956, **71**, 476. *Lancet*, 1954, **i**, 57.
26. Mahfouz, N. J. *J. Obstet. Gynæc., Brit. Emp.* 1957, **64**, 23; see also *Lancet*, 1956, **ii**, 193.
27. Everett, H. S., Mattingly, R. F. *Amer. J. Obstet. Gynec.* 1956, **72**, 712.
28. Dieffenbach, 1845. Cited in discussion after Everett and Mattingly (footnote 4).
29. Lavery, D. W. P. *J. Obstet. Gynæc., Brit. Emp.* 1955, **62**, 530.
30. Sims, J. M. *Amer. J. med. Sci.* 1852, **23**, 59.
31. Simpson, J. Y. The Works of Sir James Y. Simpson. Vol. III. Clinical Lectures. Edinburgh, 1872.
32. Collins, C. G. Cited by Everett and Mattingly (footnote 4).
33. Bastiaanse, M. A. van B. *Proc. R. Soc. Med.* 1954, **47**, 610.
34. Ingelman-Sundberg, A. *Arch. Gynäk*, 1952, **183**, 498.

surgery ; but if there is extensive destruction of tissue or fibrosis from repeated failed attempts at repair, or if the urethra has been badly damaged, the patient's interests will generally be best served by those with special experience of this abnormality.

Annotations

WORK STUDY IN HOSPITALS

IN 1946 the board of Imperial Chemical Industries Ltd. foresaw difficulties in maintaining the company's position against increasing post-war competition under conditions of full employment when extra man-power would be hard to find. They therefore went all out to make the best of the resources they had ; and one of the methods they adopted to increase productivity was work study—the application of detailed analysis to work in an attempt to expose flaws in the way it is done. As well as improving output, the increased efficiency generated by these critical analyses led, in a surprisingly short time, to better earnings, easier work, and saving of time, materials, fuel, and power. During the past ten years the central work-study department of I.C.I. has learnt a lot about work study and what it can do in the company's many divisions ; and in the belief that this experience might be usefully applied in the hospital service, I.C.I. last week held a conference at which members of the central work study department explained the techniques of work study, and what they could accomplish, to representatives, medical and non-medical, of the hospital service and to other guests closely interested in the efficiency of that service.

As Mr. R. M. Currie, head of the I.C.I. central department, put it, work study is no more than the organised application of common sense. Despite the complex techniques that have been evolved, it makes no claim to scientific accuracy : but the practised routine of its methods will point to time and energy misspent in a job which, to the ordinary " common-sense " observer, might seem to be in no need of better planning. (Indeed, Mr. P. J. Torrie, who is head of the training section of the central work study department, ruefully confessed that when he put two trainees on to an analysis of some of the work in his own department, they shook him with a well-founded plan for substantial improvements.) Nobody claims that work study is a guarantee of 100% efficiency. But much can be achieved by raising efficiency from, say, 60 to 75%.

What has work study to offer in the hospital ? On the face of it, the techniques of work measurement and method study seem best suited to highly repetitive tasks, of which there are less in the hospital than in the factory ; but those familiar with the potentialities of work study will have none of this view and maintain that it can be applied equally well to work in which there is little or no repetition of particular operations—always provided that the analysis and interpretation are performed by a well-trained work study team. Mr. J. B. Kitchin told the conference about the Delaware Hospital in Wilmington in the United States where a " work-simplification " programme directed by a " methods coördinator " was helping to provide a more efficient service for the patient. In the multiplicity of a hospital's affairs—in the wards, the stores, the laundry, the kitchens, the X-ray department, and the porter's lodge—time, money, and materials could often be put to more telling use ; and work study can identify the causes of the wastage. Some inquiries along these lines have already been made : for example, four years ago a job-analysis team of the Nuffield Provincial Hospitals Trust gathered information which illustrated that nursing resources were not being used to the best advantage.[1] But much more fact-collecting is necessary if work study is to make its contribution to hospital efficiency ; for, as the I.C.I. investigators emphasised, accurately recorded observations are the basis of their methods.

I.C.I. stressed at the conference the futility of *imposing* work study on a particular organisation : unless everybody coöperates the results will range from poor to disastrous. And, as Mr. Ben Smith remarked, fears that some members of a hospital's staff would be downgraded, as had sometimes happened after the visits of Ministry review teams in the past, would have to be set at rest. The finesse of the good work study team (and in a small concern it may be a one-man team) probably lies not so much in the technical dexterity of measurement and analysis as in understanding the other man's viewpoint and in encouraging him to bring his difficulties forward himself, so that changes come in fact from within. In such an atmosphere, progress could be considerable ; but where clumsiness breeds resentment, and even fear, there can be little hope of accomplishing anything useful. As I.C.I. have found, the key to success in this exciting new work is to find the right men and train them properly. To do work study " on the cheap " is useless.

In principle, skilfully applied work study could do much towards raising the public's regard for its hospital service ; but it cannot change matters quickly, and if it is to fulfil its promise, men and women of tact and resource must be trained in its methods as applied to hospitals. At present, industry is hard put to it to find and train enough of the right people for these duties, and there is no reason to suppose that the hospital service would be any more fortunate. Nevertheless, the valuable experience which I.C.I. has generously placed at the disposal of hospital authorities, and others who might care to use it, could be of enormous help ; and we look forward to seeing it put to good use.

BREAST-PUMPS

AN attempt has been made in Sweden by Egnell, an engineer, to provide a breast-pump which will not injure the nipple.[2] On mechanical grounds, he argues that the injury so commonly produced by mechanical emptying devices is due to fatigue in the tissues. Accordingly he has tried to produce a pulsating and momentary negative pressure which will empty the lactiferous tubules but not exceed the endurance of the nipple tissues. Although, to a medical way of thinking, the physiology underlying nipple-trauma is not the same as structural fatigue, recognition of the harmful effects of strong negative pressure is welcome. Egnell has observed that the length of time for which the pressure is sustained is important ; but presumably the biochemical changes of capillary stasis do at least as much as mere physical strain to produce the petechiæ and œdematous papillæ of an injured nipple.

Mechanical principles tend to be misleading when applied too simply to the breast. Pressure differences have to drive the milk through such sphincter as the nipple has. This is a very variable quantity. The repeatedly acting draught-reflex produces the flow of milk from the alveoli to the tubules and hence provides positive pressure behind the sphincter ; and the draught-reflex, best evoked usually by the baby taking the breast, can be set off by tactile stimuli to the nipple and the tissues deep to the areola and, secondarily, as a conditioned reflex. Because the reflex is inhibited by fear and alarm, any emptying device has to be acceptable to the mother. Some mothers completely reject an electrical device, while others find manual expression offensive.

1. The Work of Nurses in Hospital Wards. London, 1953. See *Lancet*, 1953, i, 379.
2. Egnell, E. *Svenska Läkartidn.* 1956, **53**, 2553.

As long as the method is accepted, a pump of any kind or manual expression can evoke the reflex and withdraw milk, but either can be traumatic. The old type of electric pump, which pulls the nipple and areola in and out of a glass appliance, is altogether too traumatic and should no longer be used; the hand-pump has the disadvantage that many rubber hand-bulbs will exert a negative pressure of 200 mm. Hg—considerably more than the capillaries can withstand for more than a few seconds at a time. The least traumatic and most effective of those so far on the market is the machine adapted to human needs from its dairy prototype. This kind, the humalactor,[3] has the advantage that the negative pressure exerted on the nipple is indicated on a dial. It is intermittent and easily regulated.

Recent advances in the management of lactation are reducing the proportion of mothers in need of mechanical emptying devices, but there will always be some to whom they are a great boon.

BRUCELLOSIS IN EAST AFRICA

ALMOST fifty years ago Sir David Bruce investigated the disease known by the local population around Lake Edward in Uganda as *Muhinyo*. The features of this condition were fever, sweating, arthritis, weakness, and emaciation. It had previously been regarded as a form of kala-azar, but Bruce found positive agglutinations to the organisms of Malta fever in five of seven clinical cases and in two goats. He summed up his results characteristically[4]: "Muhinyo is Malta fever. Muhinyo is conveyed from the goat to man by the drinking of goat's milk." Since Bruce's work little progress has been made in the study of brucellosis in East Africa although each year cases have been reported from the three territories in increasing numbers.

In Uganda the largest number of cases come from the Western region near Lake Edward where *Muhinyo* was originally described. This is predominantly a cattle country, although many goats are kept. The infection is predominantly due to *Brucella melitensis*. In Kenya, where the first cases of brucellosis in Africans were described in 1923, the number reported has risen from 25 in 1945 to 238 in 1950, and more than a hundred each year since then. There is no doubt that brucellosis is widespread throughout Kenya both in man and in animals. In the African population the infection is almost entirely due to *Brucella melitensis*, but the few cases in Europeans are usually due to *Brucella abortus*. Wright et al.[5] in Nairobi have noted a high incidence in middle-aged and elderly Africans. It is difficult to understand why susceptibility should increase at this age when opportunities for infection have been constant throughout life. Clinically pyrexia and arthritis are the most conspicuous features, and gross splenomegaly is not uncommon. In a country where kala-azar, malaria, schistosomiasis mansoni, cirrhosis of the liver, and idiopathic splenomegaly are frequent, the problem of differential diagnosis is serious. The resemblance to kala-azar has recently been emphasised by Manson-Bahr,[6] who has drawn attention to a very chronic form of brucellosis with great enlargement of the spleen and to a lesser extent of the liver, both of which may be tender and painful.

In treatment Wright et al.[5] have obtained their best results with a combination of aureomycin 2 g., streptomycin 1 g., and sulphadimidine 4 g. daily for fourteen days. But they consider that it may prove desirable to treat early uncomplicated cases with aureomycin only, reserving the combined therapy for chronic cases or for patients who relapse. Even with the combined therapy relapses still occur and several courses of treatment may be necessary.

In East Africa information on the incidence of brucellosis in sheep, goats, and cattle is still far from complete. Meanwhile, Polding,[7] of the Department of Veterinary Science at Makerere College, has put forward the hypothesis that rainfall encourages the spread of the disease by aggregation of animals, their increased susceptibility to infection in wet weather, and longer survival of the organisms on wet surfaces.

3. Gunther, M. *Lancet*, 1954, ii, 219.
4. Bruce, D., Hamerton, A. E., Bateman, H. R., Mackie, F. P. *Proc. roy. Soc.* B. 1910, **82**, 485.
5. Wright, F. J., Cooke, E. R. N., D'Souza, J. St. A. M. *Trans. R. Soc. trop. Med. Hyg.* 1953, **47**, 117.
6. Manson-Bahr, P. E. C. *E. Afr. med. J.* 1956, **33**, 489.

A CASUALTY DEPARTMENT

AN interesting account of the work done in the casualty department of a large non-teaching hospital has been given by Mr. J. N. Deacon[8] in his last report as medical director of the Edgware General Hospital. The department deals with 17,000 patients a year, of whom nearly 800 are admitted. It deals with all fractures in ambulant patients and completes their follow-up after reduction. It treats acute superficial sepsis, soft-tissue trauma, and cases needing various minor operations. Its functions compare closely with those of many other casualty departments, but the interest lies in the description of how those functions are fulfilled.

Even though the medical staff undertakes night cover, the establishment is generous. Two registrars and two house-surgeons are appointed, and we see evidence that at least one further grade (J.H.M.O.) may be involved. The casualty officers "can ask for and get the opinion of a consultant." The appointments are keenly contested—to the envy of many hospitals. The medical staff is divided into two teams, which alternate daily in the reception and treatment of new cases. New cases ("casualty primary") and old cases ("casualty follow-up") are separated; at second and subsequent attendances patients go to a different part of the hospital with a different entrance. Apparently, patients are treated by the medical team that saw them originally, and all repeat attendances are by appointment. This division of casualty departments into separate clinics for new and for old cases has already been described.[9] The report suggests that there "must be spacial separation and they should not even be linked"; but such separation is difficult with a small medical staff and quite impossible where there is only one casualty officer to see all cases. Many hospitals still expect one junior doctor to deal with ten thousand new cases a year, with follow-up where necessary, with no more help than can be given by inpatient housemen and registrars to cover off-duty.

The report shows a plan of the "casualty primary," which includes several valuable features. There is a separate room at the entrance for the moribund. These patients, and many other accident cases and emergencies, should not be wheeled through crowded waiting-rooms for the timorous to be appalled or the sensation-seekers to be appeased; nor should the distress of accompanying relatives or friends be exposed. The room described here should have a counterpart in the reception departments of all hospitals, and it should be equipped as a "ward" so that a critically ill casualty can receive full emergency treatment at once—or, if he is to die, may do so in private—without being moved elsewhere.

At Edgware there is an ample number of cubicles for treatment. Consequently there is very little waiting and the waiting accommodation is small. The almoner's department is associated with the waiting-room. There is an anæsthetic room separate from the theatre, and patients go from their operations to a recovery-room before being sent home. (Possibly some of the changing cubicles could with advantage open into the anæsthetic room, instead of into the neighbouring corridors.)

7. Polding, J. B. *Ibid*, p. 481.
8. Annual Report of the Medical Director on the Work of Edgware General Hospital, 1956.
9. Clarkson, P. *Lancet*, 1956, ii, 31.

A clerk is in charge of arrangements for transport to and from the hospital, and she has her own office leading from the central hall. In the department traffic lanes are arranged so that there is a minimum of counter-traffic and patients for admission can be taken through reception to be investigated or admitted to the wards without delay. The report maintains that a "sizeable . . . department needs for its exclusive use a suite of from three to six single bedded rooms. These beds should be ex-complement and solely at the disposal of the casualty staff." Perhaps this is the most important observation in an important report. The provision of casualty beds, for observation of doubtful cases and segregation of patients whose presence in a general ward is undesirable, is a long-neglected need. Many patients treated in casualty and then sent home would profit by being "detained" for one or two nights; and some are at risk because such accommodation is not available. Others (in particular those with mild concussion) who are at present admitted to the wards could occupy casualty beds and leave the more highly organised surgical beds for operation cases. The lingering prejudice against allocation of beds to casualty departments should be overcome.

A casualty department can be run effectively in more ways than one. But the method described in the Edgware report should be studied by all who take an interest in the hospital service. It has proved its worth, not only under routine conditions in its own locality, but under sudden stress as well.[10]

SPONDYLOLISTHESIS

SPONDYLOLISTHESIS, or vertebral slipping, may arise either in the presence of vertebral-arch defects or when the vertebræ are apparently normal. The arch defect, which is commonest at the 5th lumbar level, is usually revealed by oblique radiographs of the lumbo-sacral joint. The displacement may either be symptomless or be associated with low-back pain and possibly with sciatica. Adkins[11] believes that the sciatica is due to root irritation and compression in the region of the laminar defect, where there is often much cartilage. Certainly many patients are relieved by removal of the lamina and the pseudoarthrosis, but others also need spinal fusion. Vertebral displacement is not uncommon in the absence of laminar defects, and indeed such defects are rare above the 5th lumbar vertebra. Whether the displacement is backward or forward, the intervertebral foramen is narrowed and root irritation may follow. Backward displacement at the lumbo-sacral joint is usually associated with an abnormality of the articular facets in this region, which lie in the frontal plane[12]; there may be an associated disc degeneration.[13] Forward displacement without arch defects is commonest at the level of the 4th lumbar vertebra.[14]

Many of these displacements are very slight, and are usually diagnosed from standard radiographic projections. Melamed and Ansfield[15] have drawn attention to the many errors possible in the interpretation of these films, and hold that faulty technique can give rise to the appearance of backward displacement. But, on the basis of radiographic examination of the lumbar spine in flexion and extension, Morgan and King[16] have suggested that vertebral instability is perhaps the commonest cause of low-back pain. Instability is associated with a step or staircase effect, the unstable vertebra sliding backwards on the vertebra below in full extension. Even if vertebræ do thus become unstable (and the radiographs are not altogether convincing), it remains to be shown why hypermobility of this type should cause pain. If we bear in mind the range of movement which can develop in the lumbar spine of the acrobat,[17] it seems unlikely that minor movements of this type can commonly cause low-back pain. Indeed, might they not also be present in the normal lumbar spine? Nevertheless, painful backs are so common—and often so baffling—that any new approach demands consideration.

10. See *Ibid*, 1952, ii, 1117.
11. Adkins, E. W. O. *J. Bone Jt Surg.* 1955, **37B**, 48.
12. Smith, A. De F. *Ibid*, 1934, **16**, 877.
13. Fletcher, G. H. *Ibid*, 1947, **29**, 1019.
14. MacNab, I. *Ibid*, 1950, **32B**, 325.
15. Melamed, A., Ansfield, D. J. *Amer. J. Roentgenol.* 1947, **58**, 307.
16. Morgan, F. P., King, T. *J. Bone Jt Surg.* 1957, **39B**, 6.

PROGNOSIS OF STONE IN THE URETER

MOST ureteric stones are formed in the kidney, and their subsequent progress down the ureter is determined largely by their size and location. These features can usually be defined with reasonable accuracy, and it is perhaps surprising that no standards have been laid down whereby the likelihood of spontaneous passage can be assessed. Useful guidance on this is now provided by Sandegård.[18]

541 patients with ureteric stones were studied in the period 1951–54, with the object of determining how far a thorough primary investigation would permit prediction of their subsequent course. In the absence of any indication for immediate intervention most cases were treated expectantly and the progress of the stones was recorded in relation to their size and initial position. Retrospective analysis showed that small stones of radiographic width up to 4 mm. situated in the pelvic part of the ureter will usually (93%) pass spontaneously. Small stones of similar size in the upper ureter will likewise often pass (81%), but occasionally do not and may produce serious obstruction. Stones of medium size (4–6 mm. in width) in the lower part of the ureter have an even chance (53%) of being passed spontaneously, while with larger stones the prospect becomes less likely. Both medium-sized and large stones in the upper ureter may migrate to the pelvic portion within months, but as long as they remain in the upper half they may cause serious complication.

To those experienced in managing ureteric calculi such mathematical guidance may seem superfluous, and it cannot be followed unreservedly. Additional factors such as infection, severe impairment of renal function, and the state of the contralateral kidney must all be taken into account before persevering with expectant treatment. Moreover, whereas stones impacted in the upper ureter are usually readily amenable to open surgical removal, those which are left to migrate to the pelvic portion and then fail to pass may present formidable difficulties. In some cases the time factor may be important and call for early intervention, while in others the presence of additional stones in the kidney may indicate the need for wholesale clearance. Nevertheless, the emphasis by Sandegård on the fact that small stones will often pass naturally in time may act as a deterrent against ill-advised surgery and indiscriminate use of the array of stone-extractors nowadays available. The unskilled use of these instruments can cause serious permanent damage, and unless they are expertly handled it may be wiser to allow the stone to remain temporarily undisturbed. In the long run a conservative attitude, qualified by ability to intervene if need arises, seems to afford a better prospect of successful management than intervention based on rigid acceptance of a statistical estimate of prospects.

17. Wiles, P. *Proc. R. Soc. Med.* 1935, **28**, 647.
18. Sandegård, E. Prognosis of Stone in the Ureter. *Acta chir. scand.* 1956, suppl. 219.

THE barony conferred on Sir HORACE EVANS in the birthday honours has been gazetted under the name, style, and title of Baron Evans, of Merthyr Tydfil in the county of Glamorgan.

Dr. J. S. MITCHELL, F.R.S., has been appointed regius professor of physic in the University of Cambridge in succession to the late Sir Lionel Whitby.

Special Articles

EMPLOYMENT OF CHRONIC MENTAL PATIENTS

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AT this hospital in January, 1956, out of 290 men patients only 50 were employed out of the wards. By March, with the introduction of group nursing methods,[1] 160 were working in the grounds either alone or in groups. By June it was felt that some could be employed outside the hospital. A local farmer was approached and he agreed to take 4 patients. Since then, without any further effort, demands for patients' labour have been such that we have had difficulty in meeting them. To date, 60 patients have taken part in the scheme, the most employed on any one day being 59. At present 16 to 20 now go out daily, but at busy times, such as potato-picking and the harvest, the number working outside will probably again be more than 60. The farmers call for the patients and bring them back by car. The hospital provides a packed lunch, but most patients are given a substantial meal in the farmhouse. The work has varied with the season, and has included hay-making, harvesting, potato-picking, thinning turnips, and landscape-gardening. 8 patients are more or less attached to particular farms doing routine work. The ordinary rate for an agricultural worker, at present 3*s*. 1*d*. per hour, is charged to the farmers. They are more than satisfied with the quality of the work, and some would not have managed to bring in the harvest without the patients' help.

At first we paid the patients according to circular S.R.B. 50/55. The patient kept the first 20*s*. he earned, and the hospital the rest up to £2 10*s*. But we found that this system removed the incentive to work more than one day a week—a fact soon appreciated. Now it has been agreed that the patients are paid at the rate of 1*s*. 3*d*. per hour, which works out about the same for the week and encourages normal working hours. The total hours worked by the men patients on farm work from June 2, 1956, to March 16, 1957, was 19,619, and they earned over £3000. Next year it is expected that they will earn about £6000. But the real gain of course has been the increase in their general alertness and awareness. They need no prompting to go to work, and they show an interest never shown by patients employed on hospital farms and gardens, no matter how well paid.

No patient who is fit, and wishes to work outside, is prevented from doing so because he is useful to the hospital. Patients for whom there used to be no work now replace those working outside. The heads of departments are aware that patients are for training and not retaining. In the hospital gardens, training rather than production is the aim, but so far production has not suffered. All but 4 of the patients in this scheme have been chronic patients. 12 have been discharged, and though the scheme alone cannot take credit for this it has meant that they left the hospital accustomed to regular working hours. Few of the remaining patients, despite their ability to earn, are likely to be discharged. But no patient is retained if discharge is possible, and the population of the hospital has dropped by 44 though admissions rose from 184 to 443 in the past year.

To find openings for our women patients we turned to local firms and enough work was offered to occupy 9 patients. The parts of a patent toaster are assembled, polished, wrapped, and packed, and so far over 3000 have been dispatched. The work is repetitive, but the patients enjoy it because it is paid and because they are producing something useful.

In this work we were handicapped by a lack of space. But we have now arranged, by using stacking tables and chairs, for the patients to dine in the wards. The large communal dining-room has thus been freed for use as a workshop and we have not had to build a new occupational-therapy department. Indeed we have found this arrangement an improvement on the old method of massing patients together for meals without proper segregation and without any control over the eating habits of the more deteriorated.

We are trying to find more work of this kind, but there are few light industries in the district. Many of our women patients are accustomed to land work and they too have gone out in groups for potato-picking accompanied by a nurse.

COMMENTS

Many improvements are taking place in mental hospitals: wards and corridors which were dingy are now bright and well furnished, doors have been opened, and the community encouraged to interest itself in the affairs of the hospital. But the very success of these changes may obscure the need for even greater efforts being made with individual patients, many of whom remain idle and apathetic and indifferent to the changes made for their benefit, and have to be persuaded to go out through the doors left open for them. As Stern [2] says "The constant aim is the resocialisation of the patient for his eventual discharge." Martin has drawn attention to some features of mental hospitals tending to "institutionalisation" characterised by passivity and loss of interest.[3]

We have found that a daily exodus of patients going out to work and mixing with normal members of the community stimulates not only those who go out but also those who hope to follow. Where work outside the hospital is available, patients are not likely to find themselves working in the interests of the institution rather than their own, which helps to prevent institutionalisation.[3]

Because of the need for nurses to carry out essential nursing duties, patients often worked only four hours a day. But where they can leave the hospital without supervision, they can now work normal hours and the nurses have more time for those who need supervision. We have considered it advisable for daily visits to be paid to the patients at their outside work by the chief male nurse, and often by the medical superintendent. No incident of improper treatment has occurred; nor is this likely, for the patients know the value of their services and would soon withdraw their labour.

All the patients must pay the ordinary National Insurance contribution, which is deducted from their earnings. Few of them are ever likely to receive any benefits. No-one quarrels with the Ministry of Health for taking about half the patient's earnings for his keep, but when the Ministry of National Insurance insists on dependants' allowances being deducted as well, some have very little left. If more of these schemes are started, the Ministry of Health might consider undertaking the insurance of these patients.

I am grateful to Mr. Duncan Orr, the chief male nurse, for his enthusiasm for this scheme. It would not have been possible without his constant attention to detail. Mr. John Manson, the hospital secretary, has also done much extra work and has solved the scheme's financial problems.

1. Bickford, J. A. R. *Lancet*, 1955, ii, 969.
2. Stern, E. S. *Ibid*, 1957, i, 577.
3. Martin, D. V. *Ibid*, 1955, ii, 1188.

HOSPITAL ACCOMMODATION FOR CHILDREN

MEMORANDUM BY EXECUTIVE COMMITTEE OF BRITISH PÆDIATRIC ASSOCIATION

THIS memorandum has been prepared by the executive committee of the British Pædiatric Association as a statement of the principles to be observed in planning accommodation for children within a children's hospital or a children's department in a general hospital. It is concerned only with the care of children in hospital and does not consider the relationship of children's hospitals with the public-health or other social services, though it is recognised that close and good relationships are essential and that the function of the pædiatrician is not confined to the care of sick children in hospital.

Children in hospital require a different type of care from that given to adults, and children of different ages and suffering from different conditions require particular forms of care within a children's unit. It is agreed that children should be admitted only to children's wards and that within a general hospital all the accommodation (except cots in maternity units) should be grouped within the children's department even though the child is under the care of a specialist other than the pædiatrician. The provision of small groups of children's beds away from general pædiatric supervision is to the children's disadvantage and should be discouraged.

Children should be admitted to children's departments up to school-leaving age; children's departments will therefore require accommodation suitable for younger children of both sexes and adolescents. There should also be adequate facilities for the nursing and effective isolation of children with infectious diseases. Wherever initial consideration suggests that special treatment is required, the child may require treatment later in the appropriate special pædiatric unit.

TYPES OF CHILDREN'S HOSPITALS OR DEPARTMENTS

The size and type of children's units will vary with the population served, the presence of specialised units for treatment or research, and whether the hospital is or is not part of a medical school. Both teaching and non-teaching hospitals should serve as foci of interest, information, and help for family doctors.

Design and Function

(1) Whenever possible, all the children's beds in a hospital should be gathered in a single ward unit or series of units, with a designated consultant pædiatrician in charge of general ward arrangements. Only in this way can there be cohesion of policy regarding the general care of children, the control of infection, the arrangements for visiting, and the provision of education and occupational therapy.

(2) The ward unit should be about 20, and not larger than 24, cots or beds. It should be arranged in small sections for infants and children of different age-groups, and should therefore contain cubicles for infants, a nursery with cots for toddlers, and a larger section or sections with beds for older children. About one-third of children admitted to such a unit would be under the age of five years. The special difficulties of adolescence should be recognised by the provision of suitable separate accommodation.

(3) Within the same unit, although the general arrangements are the concern of the pædiatric physician, many consultants might have clinical responsibilities; if a physician, surgeon, and other specialist clinicians work together in this way, the concept is reached of a combined unit caring for sick children. Such an organisation is likely to give better results than the separation of children's accommodation into surgical or medical divisions.

(4) Such a combined unit should contain accommodation for any age-group and all conditions requiring general-hospital admission. In large hospitals or in departments with multiple units, there can be further arrangements; thus, within the combined ward unit for medical and surgical work, there might be a number of beds for children under the care of another consultant (e.g., ophthalmological).

(5) The permanent and senior nursing staff should be trained in the nursing of children and must be adequate in temperament and proficient to meet the special requirements of children and their parents.

Basic Accommodation

The demand for children's beds varies, especially in the smaller areas, within wide limits at different seasons, and is usually highest in spring and winter. Accommodation must be sufficient to meet the needs of the "peak" period; in 1953, in the Newcastle area, it was estimated that approximately 40 beds for acute conditions and 12 beds for "long-stay" conditions were required per 100,000 of the population (excluding the needs for psychiatric illness and mental defect).[1]

Types of Accommodation

An essential need of all accommodation for children is to establish and maintain the informal and almost domestic atmosphere of a children's hospital:

(1) For infants and certain toddlers: facilities for admission of child and mother; with the mother sleeping in same room as the child and helping in his care. This is particularly valuable in chronic conditions, in feeding or metabolic disorders, in "cold" surgery, and in conditions where the mother must learn techniques to enable her to care for the child at home. For acute surgical and medical emergencies and when the mother cannot come into hospital with the infant, cubicles are required for all children under one year old.

(2) Nursery accommodation for "toddlers."

(3) Small ward groups for older children of both sexes.

(4) Accommodation organised as units of space will therefore have varying proportions of cots and beds to meet the changing demands of different illnesses. Such an arrangement would give flexibility of proportion within a maximal bed complement.

(5) Isolation and observation accommodation which can be adapted as necessary for children of any age. Indeed, all types of accommodation should, as far as possible, be organised as "units of space" so that the proportion of children in different age groups can be varied as demand requires.

(6) In future, accommodation for the so-called "infectious fevers" should be available within the general hospital or children's hospital, though special arrangements may be required to deal with infective gastro-enteritis or intermittent epidemic diseases.

(7) In each ward unit adequate "corridor services" are required—milk kitchen, preparation and treatment rooms, recovery rooms, parents' waiting and interview rooms, staff room, registrar's room, &c. These are integral parts of any ward unit.

Each children's unit or hospital should have attached an appropriate number of consultation clinics and also provide a domiciliary consultative emergency service which should be a major part of the work of the staff of a children's department. This will be a wholesome influence as it will bring the hospital staff, the family doctor, and the domiciliary nursing services together, coöperating in the care of the sick child at home.

Differences in function between the larger and smaller units are not, therefore, fundamental, and large and small units require the same general design and content; but this design does require that the teaching hospital as well as the regional-board hospital have a "parish" from which it receives its sick children, and the teaching hospital must not become merely a collection of specialised units. As a matter of policy, specialised facilities will be shared between the teaching and non-teaching regional board hospitals.

1. Spence, J. C., Taylor, M. D. *Lancet*, 1954, i, 719.

STAFFING

Medical Staff

In teaching hospitals there will usually be an additional staffing of university and hospital consultants, and a grouping of clinical and research interests and responsibilities. The larger departments will require a resident of senior or middle registrar grade, responsible for admissions and the selection and distribution of patients. He would also help in teaching and administration. In combined units there would be a pædiatric registrar and house-physician, but also coming into the unit would be the registrars and housemen of other specialties. Consultant staffs should be large enough to allow physicians and surgeons time for inter-unit consultation, for group meetings, conferences, and adequate holiday cover.

In regional hospitals the problem is more difficult unless the areas of population are large enough for two pædiatric consultants to be appointed who, working together, would give each other the necessary companionship, support, and cover. Regional hospital boards should consider grouping areas to make it possible for two pædiatricians to work together. In smaller hospital centres, experienced senior residents will be more difficult to obtain, and the consultant will normally have to exercise greater control of detail and have correspondingly less time for clinical research than his colleagues in other hospitals, especially the teaching hospital. Transfer of children to regional centres will sometimes be required for special treatment, investigation, or research, but the area consultant should be able to obtain a visit and any necessary help of other pædiatricians or consultants without his patients necessarily being transferred to a teaching hospital or a larger regional-board hospital.

In many cases one or both pædiatricians in an area will also have a direct link with the teaching hospitals either by outpatient work, inpatients, or some part in research. Thus, the professional isolation of an area consultant can be avoided. In accordance with the original intention of the National Health Service Act of 1946, there should be integration of the regional hospital and the teaching hospital.

Nursing Staff

The British Pædiatric Association believes that the teaching hospital or large non-teaching hospital should have a training-school for children's nurses to combine the stimulus of a training-school and a source of children's trained sisters and staff nurses for the hospitals of the region.

Staffing of Pædiatric Sections of Maternity Hospitals

The precise staffing will vary with the size and situation of the maternity hospital, but all maternity units should have a consultant pædiatrician as a member of the staff. The training of junior obstetrical staff in the care of the newborn under the consultant pædiatrician has been welcomed by the Royal College of Obstetricians and Gynæcologists. In teaching hospitals and large central hospitals there should be a pædiatric consultant, a full-time pædiatric registrar, a designated sister with pædiatric responsibility, and nursing staff for the care of premature infants and sick infants. In a large maternity hospital the demands upon the time of the pædiatric staff may be very great indeed. In the joint work of obstetrician and pædiatrician lies the greatest hope of a further reduction, not only in fœtal and neonatal loss, but also of morbidity and its consequent social problems.

CONCLUSION

This memorandum gives the broad principles underlying the conditions required for the care of children. Local conditions and needs may require great variation of detail.

Conferences

THE LIVER

AN International Conference on Hepatology was held on June 18–20 in Perugia under the presidency of Prof. G. DOMENICI. The main subjects discussed were liver biopsy, acute hepatic necrosis, and hepatitis.

J. CAROLI (Paris) compared the value of liver biopsy and peritoneoscopy in the diagnosis of liver diseases. It was now possible to obtain beautiful colour photographs of the liver surface using a camera with electron flash attached to the peritoneoscope. This technique was found of more value than biopsy in the diagnosis of local liver lesions such as cysts or tumours, and safer in the presence of hepatic-vein occlusion, acute liver necrosis, hæmangioma, or mechanical biliary obstruction. Liver biopsy proved of more value in diagnosis of generalised disorders such as fatty liver, amyloid, or hæmochromatosis. H. KALK (Kassel) also emphasised the value of peritoneoscopy in diagnosis, especially of local scars (" potato " liver) developing after recovery from virus hepatitis. Liver-function tests were usually normal, and patients with this lesion had a better prognosis than those with a true post-hepatitis cirrhosis.

G. MENGHINI (Perugia) said that the risks of needle biopsy depend on the diameter of the needle and the time taken. He had devised a 1 mm. bore needle with a nail-like structure in the shaft preventing the biopsy being fragmented by aspiration into the barrel of the syringe. This method was very rapid in execution. H. THALER (Vienna) had performed serial post-mortem liver punctures in 36 patients succumbing to acute liver necrosis and had observed the development of rapid and severe hepatic changes. He regarded the post-mortem appearances as bearing little relation to changes in life.

In a general discussion on bile retention, G. ALBOT (Paris) described a liver lesion consisting of proliferating ducts of Hering in the portal zones, fibrosis appearing later. This might be present in patients with partial biliary obstruction without clinical jaundice and with normal liver-function tests. These lesions regressed if the cause of the obstruction—e.g., gall-stones or traumatic stricture—was relieved. Dr. Albot speculated that the apparent ductular increase represented dedifferentiated liver cells; and H. POPPER (New York) agreed with this, the liver cells becoming smaller, the cytoplasm losing glycogen and ribonucleic acid. Dr. Popper believed that the ductular increase stimulated adjacent connective-tissue proliferation.

A. B. GUTMAN (New York) reviewed the subject of intrahepatic cholestasis due to such drugs as arsphenamine, methyltestosterone, and especially chlorpromazine. This last drug caused an obstructive type of jaundice in 1–2% of patients receiving it for one week. The reaction-rate was probably higher; for liver biopsies from people receiving the drug, but without showing clinical jaundice, often showed cholestasis. The early onset, often after as little as 20 mg. chlorpromazine, the frequent fever, rashes, facial œdema, and eosinophilia, suggested allergy. In support of this he quoted L. E. Hollister who had demonstrated recurrences in 6 of 11 subjects given chlorpromazine after recovery. The jaundice might also be toxic, the chlorpromazine being changed in the liver to some metabolite which injured the microscopic biliary tree. Prognosis was usually excellent, although the development of biliary cirrhosis remained a possibility. S. SHERLOCK (London) questioned whether the progress of drug jaundice to cirrhosis had been proved. She cited a patient who had had chlorpromazine jaundice for more than one year and had developed xanthomatosis. The liver biopsy still showed only the features of mild biliary retention without fibrosis or cirrhosis. She also questioned the applicability of the term " cholangiolitis " to these patients when the anatomical site of the lesion remained unknown. A similar picture might develop in the course of virus hepatitis but liver histology usually showed minimal centrizonal parenchymal damage and, in contrast to drug jaundice, the serum-bilirubin level fell rapidly with corticotrophin treatment.

H. POPPER defined the cirrhotic lesion as showing regenerative nodules and connective tissue septa joining portal vein and hepatic vein. The post-necrotic variety showed broader connective-tissue bands, and regenerative nodules of different sizes often containing more than one normal lobule. In the United States this was often found in women with high serum-gamma-globulin values and without a preceding history suggesting acute massive necrosis of the liver. Rats given the methionine antagonist ethionine developed a post-necrotic type of cirrhosis with raised serum-gamma-globulins but without at any time being jaundiced. These animals showed gradual focal necrosis of liver cells and it was possible that post-necrotic cirrhosis in man might develop similarly.

A. MARTINI (Hamburg) described patients with severe liver failure who were salt-depleted after some time on a salt-free diet, mercurial diuretics, and having abdominal paracenteses. They had severe abdominal cramps and acute dilatation of the stomach. Oliguria and uræmia were associated with a glomerulitis at necropsy. The electro-encephalogram was typical of impending hepatic coma. Serum-sodium values ranged between 112 and 128 m.eq. per litre and the blood-pressure was low. Sodium administration sometimes caused transient improvement, but the outlook was very poor. P. DE'SCHEPPER and J. VANDENBROUCKE (Louvain) had investigated altered keto-acid metabolism in hepatic coma. Increased levels of alpha-ketoglutarate and pyruvic acid in the serum in acute hepatitis and cirrhosis were similar to the elevations which followed carbon-tetrachloride liver injury in rabbits. These were little changed by administration of ammonium chloride. Administration of glutamic acid increased the blood-alpha-ketoglutarate level in rabbits poisoned with carbon tetrachloride and in patients with liver disease. The mechanism must involve decarboxylation and was very complex.

The Wider World

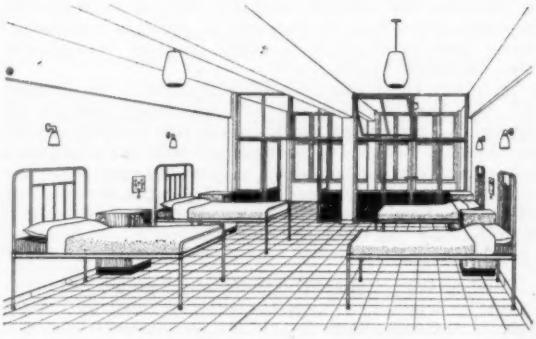
THE NEW HOSPITAL AT QATAR

QATAR is among the few peninsulas on this planet that point north. It is a sheikhdom on the Arabian side of the Persian Gulf, inhabited by some 35,000 people. Formerly they lived as best they could, chiefly by fishing and on the proceeds of a dwindling pearl industry; but in late years oil has been found there, and since its export began in 1949 the State has achieved enormous prosperity. Like his neighbour in Kuwait, the ruler, H.H. Sheikh Ali Bin Abdullah Bin Jasim Al-Thani, has decided that the new wealth should be used for the benefit of his subjects, and one of the fruits of this decision was the opening in February of the new State hospital, where all treatment is free.

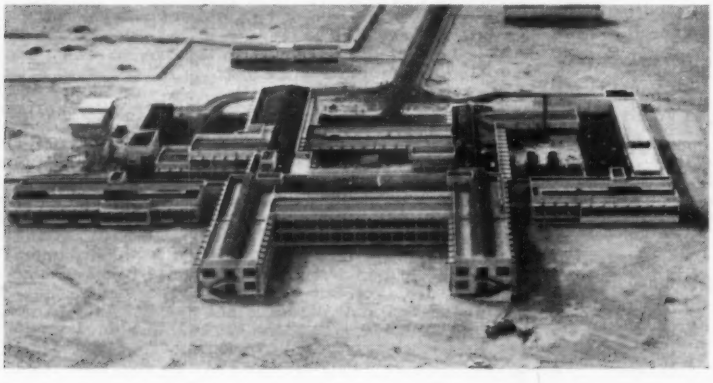
An international competition, in which 74 designs were submitted, was organised by the International Hospital Federation; the assessor, Mr. A. S. Gray, F.R.I.B.A., awarded the prize to Mr. John R. Harris, A.R.I.B.A. His design was approved by the government in 1953. The building in profile looks strikingly like an ocean liner. It lies on a site not far from Doha, the capital, with fine views north to the sea, and it is so designed that every ward can enjoy these views as well as the prevailing northern breeze. In making a part basement to house air-conditioning plant and services, advantage has been taken of a 10-foot fall across the site. Ample residential accommodation is laid out to the west of the hospital.

The site indicated the need for extensive prefabrication. The steel-work was designed and made in Britain, but much local material was used for the stone and concrete work. Special provision had to be made for expansion and contraction of the steel with changes in temperature. Oxygen, nitrous oxide, and suction pipes are supplied to operating-theatres, anæsthetic-rooms, and some surgical wards. About 1000 workmen were employed to build the hospital—the biggest project undertaken in Qatar, taking two and a half years. Among those responsible have been Mr. G. M. Hancock, O.B.E., His Highness's adviser; Dr. G. R. C. Palmer, and his successor as State medical officer, Colonel A. E. Kingston, O.B.E.; Dr. A. H. Samy, O.B.E., assistant State medical officer; Lieut.-Colonel R. D. Ewing, the hospital surgeon; Dr. A. G. Gotting, medical officer of health; and Mr. H. T. Hale, the State engineer. Dr. C. Elgood is the consultant physician, and other specialists are to be appointed.

The hospital has a total of 130 beds (54 medical, 42 surgical, 20 traumatic, 6 recovery, and 8 isolation); these are already in use. A 66-bed tuberculosis annexe is being built. There are 5 operating-theatres, a pharmacy and laboratory, and departments of diagnostic and therapeutic radiology and physiotherapy. On the staff are some 20 doctors and 70 nurses, and a modern signalling device has been installed.



The men's medical and surgical wards occupy the ground floor, on which there are separate orthopædic and isolation units (the former hospital has been converted to a maternity and gynæcology unit). The women's medical and surgical wards occupy the first floor. The wards consist of rooms each containing one to six beds, and the design of the building allows for the construction of additional wards adding over 80 beds. It also allows for cross-breezes to most parts of the hospital in case the air-conditioning system should fail: the steel windows are side-hung to form a scoop to the breeze. There are sunbreakers of wood and aluminium. Their importance is evident in an area where shade temperatures may reach 118°F with a high humidity.



In England Now

A Running Commentary by Peripatetic Correspondents

ANYONE who has had any experience of organising meetings knows that at a large international conference slides will do all the horrible things theoretically possible (most of them because the people who give papers do not explain to the projectionist beforehand how to put their peculiar type of picture into the lantern), that people won't stop talking, but will come late, will change their plans at the last minute, will feel ill, and will have pieces of paper they think are worth money but which in fact are not. At the International Congress on Occupational Health at Helsinki all these small contretemps have been smoothed away with a quietly efficient grace which could not have been equalled anywhere else in the world.

Chief of the other memories, outside the formal sessions, which will remain was the Sibelius concert, by a national orchestra in the setting of its own country, performed as Sibelius has never been heard before. The grey solid seriousness of the music fitted the building and the people. Nor will I forget the magnificent institute of occupational health with its annual salaries and wages expenditure of about £72,000 for a national working population of about 400,000 we were told. The fact that this is about the working population of Tyneside and Wearside combined made some of us thoughtful. A last memory will be the deepening shadows under the eyes of some of the 103 British members as Finnish hospitality left its mark.

And now for a few quiet days in a secluded fjord at that little place where we had that wonderful green soup two years ago, before I return to the desk loaded with smutty papers which won't remind me much of the immaculate desks which I saw in Finland.

* * *

Having sold everything in Sydney, we are refurnishing from scratch at Harrods' auction sales. K. is getting the technique but needed watching at first. At one sale I arrived just in time to stop her bidding for a harp, orchestral size, painted white, with no strings but many woodworms, which she thought might amuse our Bill, who collects odd musical instruments. There was another sale last week at which we hoped to get some beds; but I noticed with some concern the way K. was looking at certain lots in the catalogue, such as a Bechstein grand piano, a ukelele, a woodcut by Albrecht Dürer, and a job lot which started with a gent's electric cooker and finished with "and a stuffed alligator." I did my best. "Beds before Bechsteins," I said, but I could see that the iron had entered into her soul. The first day of the sale she bought the Bechstein for £60, a truly magnificent instrument, and after this there was no holding her. The second day she arrived home carrying (1) the ukelele (for Bill's Xmas present), (2) the woodcut by Albrecht Dürer, looking, alas, suspiciously clean after 450 years but "what do you expect for twenty-five bob—the Mona Lisa?" and (3) the stuffed alligator, which she had acquired by barter from the man who got it thrown in with the electric cooker.

The alligator, which we are calling Albrecht after the woodcut, is a happy saurian, stuffed in a characteristic attitude with wide open mouth. I thought it would be interesting to see how the Maudsley reacted to a member of the staff coming in to work with a stuffed alligator under his arm. So we set off on Friday with Albrecht to traverse the Bakerloo. Most people didn't notice him, or hastily averted their eyes, but an occasional faint shriek from our wake told us where a rash lady had plucked up courage to look twice; and there was the man who got in at Baker Street, stared, started, and said "My God, not so early in the morning!"

I had business in Oxford Street and left K. to deposit Albrecht in the left-luggage office at The Elephant. En route she fended off inquirers by simply stating that she was taking him to the Maudsley—a statement which brought enlightenment but not reassurance to her fellow travellers. In due course I collected Albrecht at The Elephant, proceeded by bus to Denmark Hill, and entered the Maudsley with him. Alas, I might as well have tried to upset the sangfroid of a Palace sentry. The staff is *quite* used to people who won't be parted from stuffed alligators, and probably has a Greek name for them; and the patients have got so tired of seeing alligators, elephants, &c., in Denmark Hill that they no longer give them a second look.

* * *

It's beginning to dawn on me that perhaps we G.P.s are rather biased in our attitude to the Common Man. To us he is obviously a neurotic. Every time the fellow speaks it's about his lumbago, his G.U., his migraine, his bowels even; and when he is not talking about himself he is ringing us up to say his wife is off colour, the baby is teething, or Johnny has got the measles. Yet strangely enough when in our scanty leisure we wander forth, stethoscope and E.C.10s cast aside, the Common Man has changed. He actually talks like a normal individual and doesn't seem to be even thinking about his health. Perhaps we've been wrong all the time. After all, in the mind of my Bank Manager I'm probably only someone who is always short of cash, whose literary efforts are exhausted by signing a cheque, and whose reading doesn't go beyond the monthly statement, or perhaps in more lucid moments the *Stock Exchange Gazette*. To my grocer I'm doubtless a gourmet whose mind is full only of thoughts of frozen peas, the price of tea, and Dutch cheeses. He probably thinks I spend the whole night concocting impossible grocery lists. To these people we are not the all-powerful doctor whose word is law: we are merely customers or clients who occasionally can be rather stupid.

When all is said and done, we are not really different from other people; and sometimes it is a good thing if we remember it.

* * *

The young doctor who wrote a little while ago saying that he was contemplating taking on a newspaper round to supplement his income might like to hear about my husband's little sideline.

During the summer months he places outside his surgery door a large tin bath of ripe mangoes (off his own trees incidentally) and sells them at a penny a time to patients on their way out. (Or on their way in if they prefer it. He's not fussy.) Business is always brisk and it is sometimes difficult to know whether the patients come for treatment and cannot resist the sight of the juicy-looking fruit or whether people in the neighbourhood hear there are mangoes for sale on our farm, come to buy, and then decide they might as well show the Bwana Doctor their swollen legs or tell him about their loss of appetite while they are about it. Either way it works well, particularly as both vegetable and medical transactions are strictly cash; but it is noticeable that my husband's practice drops off at the end of the mango season.

* * *

Come to think of it, if we've got to work in the summer there are worse things than being a G.P. in a seaside town.

With car roof open and windows at their widest, thoughts of Wimbledon in the 90s and the glass still rising hold no terror for us. True, an over-heated surgery may sometimes be a bit of a problem, but summer ailments generally being short and simple the wise G.P., with his desk strategically placed between door and window, can generally regulate the opening and shutting of the surgery door as patients come and go, to keep the room adequately aired. Temperature apart, the whole atmosphere of a seaside town in July and August is conducive to a holiday mood. Where else could the waiting-room floor daily yield its quota of sand? Where else could the surgery be invaded with fishhooks in fingers, sunburnt backs, and sand-filled ears? Where else, too, do grateful patients leave behind them fresh-caught mackerel, scollops by the dozen, and maybe even a lively crab?

We get our polios, we notify our measles by the bookful, we get our summer Ds and Vs, and we don't get the big lists of the Midlands. Sometimes in the midst of the flu and flurry of the winter we wonder if we can possibly make do. Then we think back to those sunburnt crowds, the sunbaked beaches, the sunsets across the estuary, and we know that though we'll never make our fortunes we are content.

Letters to the Editor

CONSULTANT AND SPECIALIST

SIR,—The burden of your leading article in the issue of June 1 is to establish and perpetuate a grade of specialists between consultants and those in training; in short a subconsultant grade.

While admitting that the problems of hospital medical staffing are fraught with difficulty and complications, it must be said that in the opinion of a large and well-informed section of the profession the solution suggested is not in the interests either of the community or of the profession.

The underlying problem is one of work to be done and salary to be paid. The evidence, which is borne out in your leader and survey, shows without doubt that the work is consultant work. If this work is to be performed by doctors who have shown themselves fit for consultant status, then to employ them on a salary-scale lower than that for consultants, and with no assurance of eventual accession to the higher ranges of the consultant salary, is to exploit them. If, on the contrary, a grade is envisaged which will be peopled by doctors of less than consultant quality then the public is being denied the service which the Minister is obliged by the Act to provide and which, in any case, is its due.

The organisation we represent has resisted and will continue to resist the establishment of such a grade as you advocate.

T. HOLMES SELLORS
Chairman, Central Consultants and Specialists Committee.

GILBERT I. STRACHAN
Chairman, Medical Staffing Subcommittee.

SIR,—The views expressed by Dr. Horace Joules (June 29) deserve the greatest possible support, and there must be many, particularly among consultants and senior registrars, who welcome his lead. The need for more consultants and their more effective distribution throughout the country is manifest from the outpatient and inpatient waiting-lists alone. Senior registrars are necessarily employed in doing much work of consultant character, and the serious difficulty which they experience in obtaining consultant posts after four or more years of effort and experience is poor reward for effectively buttressing the National Health Service; their plight causes increasing anxiety. It is a reproach which should weigh on the conscience of every member of the profession, and particularly of hospital consultants, that many fully trained and experienced men, mostly in their late thirties, are faced with the frustration of numberless interviews in a vain search for suitable employment.

Of a total of some 1200 paid senior registrars in Great Britain in June, 1956, 374 were in their fourth year or in subsequent "transitional posts." These, in particular, compete with university candidates, S.H.M.O.s, and others for the 200 to 250 consultant posts which are said to fall vacant annually. The first-class clinician, who may not have held a teaching-hospital appointment and whose inclination has not been towards research, often fails before selection committees to obtain either the credit or the job which he deserves. And yet, as your leading article of Dec. 9, 1950, remarked of senior registrars who have been doing advanced work satisfactorily, "it seems a little odd to tell them that they must forthwith stop doing it because, now that their training is over, our principles forbid us to offer them anything less than the consultant posts they cannot get." Since then, senior registrars have at least been given an undertaking by the Ministry that they will not be summarily dismissed from the service on completion of their training, but for many this is cold comfort.

The suggestion of a new grade of specialist or subconsultant, although it might meet an immediate need, seems nevertheless to be unsatisfactory from a long-term viewpoint. It would have to be recognised both by the holder of such a post and by his hospital that an appointment originally intended as transitional might, if younger men were appointed over him, become permanent.

The emphasis of the present cry is not so much on "jobs for the boys" as on "consultants for the country." The only clear, honest, and logical solution is the creation of more consultant posts, particularly in some densely populated parts of the country where they are most needed; and this must necessarily be coupled with the long overdue provision of adequate accommodation in our out-of-date hospitals. Where there is medical opposition to the appointment of new consultants, lack of beds or outpatient rooms is usually the most important reason. Sometimes there are complaints of a shortage of supporting staff. But more consultants would reduce each other's load and the abolition of conscription should increase the number of applicants for short-term junior-registrar posts. Many who have no intention of becoming consultants would welcome a further year or two of experience in hospital and contacts of this sort would be of value later in general practice.

The root of the problem being financial, the final decisions must be for Government of the day, acting on the recommendations of an authoritative parliamentary committee, such as Dr. Joules has suggested. May we hope that the leaders in the profession will press for the appointment by Parliament of such a select committee?

An atmosphere of frustration, cynicism, and hope-deferred is infiltrating the National Health Service, and this has a serious effect, particularly upon the younger men who climb the insecure ladder to consultant status and who deserve more encouragement.

Some of us, who are consultants, and others whose enforced anonymity should shame us, have done what we can to emphasise the urgency of the situation. But speeches, articles, and letters during the past four or five years have so far achieved little or nothing. It is true that the senior-registrar establishment has now been reduced to a figure more in keeping with the anticipated consultant vacancies, but there are still some 220 time-expired senior registrars competing for consultant posts. It is possible that after July, 1958, when pensions mature for those who have served ten years in the N.H.S., some extra consultant vacancies may arise. But more must meantime be done to supply consultants who are needed from amongst the surplus senior registrars now fully trained and ready to undertake responsible work.

A focus of information and action is required and, as the general public becomes more aware of the needs of the National Health Service, it seems increasingly necessary to urge the immediate appointment of some such committee as Dr. Joules suggests. The committee should review the present distribution of consultants and advise where more are needed. In some places new appointments could be made without providing new accommodation; in others minor or major rebuilding might be a prerequisite. The future of fully trained senior registrars should also be specially considered and means devised for relieving the present temporary bottle-neck by an early increase in the number of consultant posts in specified branches. The training and experience, let alone the economic security, of these men is not to be lightly disregarded.

When young men are discouraged from embarking on a consultant career, when their elders seem powerless, and when much cheap labour and dilapidated hospital buildings are tolerated, the whole morale and future of the National Health Service is at stake.

Successive Ministers of Health have seemed to be little moved by the feelings and opinions of the medical profession. Neither the Royal Colleges nor the Central Health

Services Council nor the Joint Consultants Committee can do more than act in an advisory capacity. And so long as the Minister of Health is without a seat in the Cabinet, indirect influence upon the Treasury or on Government policy appears to be negligible.

The committee which is proposed might therefore be only the forerunner of a much more comprehensive standing medical committee which would include or coöpt distinguished representatives of all branches of the profession. This body, in addition to offering advice, should be able to publish its views and recommendations in the hope of making its influence felt, in a way which is at present impossible, upon those who are ultimately responsible for the organisation of the National Health Service.

London, W.1. ERIC C. O. JEWESBURY.

SIR,—I disagree with the views put forward by Dr. Leeson in his letter of June 29.

I believe that 90% of all cases, seen and treated by general practitioners, are stress disorders, and that in about 90% the stress is irremovable.

It follows, therefore, that in the main the G.P. cannot cure: he can only palliate, which he does with a greater or lesser degree of success.

The patient, soon finding that his condition is not cured, or sometimes not successfully palliated, then seeks other advice, or other reassurance, which today usually means going to a hospital.

So, I believe that Dr. Leeson's analogy of the G.P.s as the fighting troops in the battle against disease is completely false.

The "best G.P.s," in Dr. Leeson's sense, have often the smallest practices, and vice versa, and for this reason. The G.P. quickly discovers that one of the best ways of building a large practice is to give his customers or his patients what they want, and what they want today among other things are plenty of technical investigations of every kind and variety.

The best way of relieving the pressure on the out-patient hospital service would be to convince patients that many, if not most, of their investigations are not necessary, and that in any case will make no practical difference to their treatment. This, obviously, is a difficult if not impossible task.

The only alternative, as has been pointed out by you, Sir, and others, is to appoint many more assistant physicians and surgeons.

London, W.5. MYLES LASK.

SENIOR REGISTRARS IN DERMATOLOGY

SIR,—Undoubtedly senior registrars in dermatology have had a difficult time during the past five years and too many have waited too long for consultant posts.

As a consequence applicants are not coming forward to fill senior-registrar posts as they fall vacant and, in teaching hospitals in particular, this is seriously embarrassing the service to the patient and the teaching of the undergraduate. It is particularly disappointing that men holding senior-registrar posts in general medicine, for many of whom the prospect of a consultant appointment must be small, should not turn to a specialty like dermatology where their general medical training would give them definite advantages. Many of us would be pleased to have such recruits to dermatology even without previous dermatological experience.

Fortunately in the past year, and at an increasing rate, consultant posts in dermatology are becoming vacant and in the next five years vacancies together with new posts should make the prospects for such men good. It will be sad if we have not trained men ready to take these posts and I feel that a little foresight is necessary now, a looking forward rather than backward to the bad old days.

Leeds. J. T. INGRAM.

THE INFLUENZA EPIDEMIC IN INDIA

SIR,—In the now prevalent influenza epidemic in Bangalore (which started in the first week of May) I have been consulted in about 187 cases (of both sexes) in which the diagnosis of influenza had been made on clinical grounds only. Your readers may be interested in some of the features.

In the earlier cases the anterior fauces were scarlet with prominent tortuous blue veins, specially on the uvula. The fever ranged between 102°F and 103·5°F; splitting headache, specially in the frontal and the temporal regions, was a prominent feature. Muscular pains all over the body, pain in the lumbar region, persisting for 5–7 days after the fever came down (pyrexia lasted usually 48–96 hours), and lassitude were common.

In a few cases (7%) hiccup, pain in the upper part of the abdomen, and nausea were also noted. In 3 cases only, there was mild jaundice and in 2 of them the liver was palpable just below the xiphisternum; tachycardia, for about a week, occurred in 40%; and in about 17% a mild bruit was audible over the mitral region.

It is interesting to note that influenza with severe headache attacked 7 pregnant girls (para 1 or 2) during the second to fifth month of pregnancy; but in five of the households I visited, 5 girls pregnant from seven to nine months (para 1, 3, or 5) did not show any signs of fever or headache, though they were in contact with relations of all ages who were having attacks of fever during this epidemic.

No antibiotics were given to any of these patients. In view of the conflicting reports about the type and virulence of the virus, it will be interesting to know (*a*) whether the liver is also affected by the virus, and (*b*) whether in the latter months of pregnancy there is some factor which resists the entrance of the virus.

Gandi Nagar, Bangalore, 9. C. V. NATARAJAN.

THE STATE OF DEVELOPMENT OF NEWBORN AFRICAN CHILDREN

SIR,—The article by Dr. Geber and Dr. Dean in your issue of June 15 is of considerable interest. To my mind it is important to repeat these tests immediately after the birth of the baby. Although 37 out of their 107 patients were tested within twenty-four hours, a great deal can happen in this time. One would like to know how much time the African babies had spent in their mothers' arms or bed compared with their European and Asian contemporaries. Was "rooming in" practised by all three communities? Even where "rooming in" is adopted the African baby is usually picked up, fondled, and suckled as soon as it begins to grizzle, whereas the European baby is turned over, patted on the back, or otherwise encouraged to return to sleep until the next four-hourly feed is due.

A recent film shown by Dr. Margaret Mead gives an admirable illustration of the development of a newborn baby in New Guinea.

Dr. Geber and Dr. Dean observe that "the African child sucks vigorously at the breast almost from the first hour." How many European babies have a chance of sucking within the first hour? It is generally recognised that the sucking reflex may be vigorous soon after birth, but if not stimulated it may diminish.

The ability of a baby to hold his head up depends to some extent on the length of the neck. In the African the neck is often comparatively short.

It would be interesting to know what proportion of each group of babies were first-born—in fact, how many of the mothers are experienced. This will be of some significance. But in fact, whereas many European primiparæ have had nothing whatever to do with a baby until their own is born, nearly all African primiparæ are well accustomed to handling other people's babies. This would also apply to many Asian families. Some, however, are so "Westernised" that they would resemble the Europeans in lack of experience.

It is true that most children born in the tropics appear more loose-jointed than those from what are termed more bracing climates; but I believe this applies to European as well as to other tropical children.

"Child development" is now regarded as a subject of major importance. It is essential to distinguish between intrinsic differences and those that depend on environment. These studies are of very great interest and I hope that some aspects of causation may be considered in future articles.

London, S.W.12. CICELY D. WILLIAMS.

RELATIVES IN HOSPITAL

SIR,—At this hospital there has been in operation for four years a hostel which has worked so satisfactorily and so cheaply that I feel possibly your readers would like to know something of it.

A heterogeneous group of units occupy this hospital, as a consequence of which there is one small unit unused which had accommodation for some 6 patients with an annexe and small kitchen. We have placed simple furniture in this unit with no luxuries whatsoever; hostel arrangements for relatives are made direct with the sister of the ward concerned. These relatives buy meal tickets at the canteen. Records reveal that serving a hospital population of some 180 general beds and 500 mental beds we have never needed more than these 6 beds. Indeed, commonly only 2 or 3 of them are in use.

Adjacent to this hostel unit is a large garden and the hospital chaplain has an office within the unit.

The unit literally costs nothing to administer apart from the very slight domestic requirements. It is, of course, entirely informal.

Hill End Hospital, St. Albans. HAROLD PALMER.

MYASTHENIC CRISIS

SIR,—The treatment of a patient with myasthenia gravis with *d*-tubocurarine, as described by Dr. Churchill-Davidson and Dr. Richardson (June 15), is very interesting. In 1953 we treated a myasthenic patient with curare.[1]

This patient, a bricklayer, had not been able to work for about two years, in spite of neostigmine therapy. After curare, he could resume his normal work for six months, using the same dose of neostigmine as before. After that he gradually deteriorated and needed increasing doses of neostigmine and was no longer able to work. This result seemed encouraging to us. One of us had the pleasure in discussing this case with Dr. Richardson and it is interesting to see that he and Dr. Churchill-Davidson have now also promising results with this treatment.

But since then we have treated 3 more patients in this way with less success. In the first one there was again an improvement after curare, and, despite the fact that she took only half her usual dose of neostigmine, she was objectively and subjectively much better. The objective improvement, however, lasted only a fortnight, while the subjective feeling of recovery lasted about two months. In the second and third cases there was no improvement at all after curare. One of these patients was treated after a severe myasthenic crisis, during which all neostigmine was stopped. Unlike Dr. Churchill-Davidson and Dr. Richardson we noted a definite curare sensitivity in this patient, for she needed only about a tenth of the dose that is necessary to paralyse tetanic patients. After the curare treatment there was no improvement.

There is a major difference between the technique of Dr. Churchill-Davidson and Dr. Richardson and our own. In their patient the curare treatment lasted for eight days, whereas in our patients the duration was only twenty-four hours.

As myasthenia is a disease with remission it is difficult, from so few cases, to conclude that curare treatment is really valuable, but it seems worth investigating further. In due time we hope to be able to give full details of our findings.

Department of Neurology, State University, Utrecht. D. v.d. MOST VAN SPIJK.

Department of Pharmacology and Endocrinology, National Institute of Public Health, Utrecht. W. LAMMERS.

1. Lammers, W., Most Van Spijk, D. v.d. Verslagen en Mededelingen betreffende de Volksgezondheid, 1955, 1098.

THE NEWBORN INFANT'S OXYGEN-SUPPLY

SIR,—The recent articles on cardiopulmonary physiology at birth have been very stimulating; and I have enjoyed reading Dr. Mavis Gunther's paper, Dr. Bonham Carter's survey, and your leading article in the issues of June 22 and 29.

Although, as Dr. Bonham Carter has said, research has suddenly advanced our knowledge of the initial expansion of human lung, it has also increased our speculation about those aspects of neonatal pulmonary physiology and pathology about which we still know so little, particularly the pulmonary syndrome of the newborn and hyaline membrane.

Jaykka's[1] demonstration of capillary erection in the lungs is interesting and important, but it is possible to criticise his experiments: he used dead tissue, the force applied to the fluid in the capillaries was not dynamic and pulsatile as in life; and he was obliged to destroy the blood corpuscles before successful erection was obtained, and then only with a pressure of 80 mm. Hg. But despite such criticisms his findings suggest that complete alveolar expansion may be assisted by capillary erection.

The experiments of Dawes and his colleagues[2] undoubtedly demonstrated a very high peripheral vascular resistance within the unexpanded lung of a newborn lamb, and Lind's beautiful angiocardiographic studies seem to confirm this in the human by demonstrating reversed flow through a patent ductus arteriosus in an asphyxiated infant.

Now Dr. Bonham Carter argues that the increased cardiac output in these infants is necessary to overcome the peripheral vascular resistance, distend the capillaries, and so *initiate* expansion of the lungs. This I find difficult to believe, although I accept the fact that filling of the capillaries during aeration of the lungs will assist in the rapid "lighting up" of the lung fields. Indeed, I regard the existence of pulmonary hypertension in the asphyxiated neonate as a major threat to his lungs, which may be temporarily warded off by reversed flow through the ductus so long as the lungs remain unexpanded, but which leads to immediate and excessive pulmonary filling with capillary engorgement when the peripheral resistance falls following aeration of the lungs. This, I contend, is the time when one begins to see Taussig's sign of overfilled pulmonary vessels—the gross intercostal and sternal insuction which is such a remarkable feature of the pulmonary syndrome of the newborn (the "forward" form of pulmonary capillary distension to which Dr. Bonham Carter refers). Under such circumstances pulmonary œdema may occur, especially in premature babies, and this may be the precursor of hyaline membrane. The latter, together with the increased rigidity of the overfilled lungs, interferes with respiratory exchange and leads to ever increasing anoxia which may prove fatal.

There are difficulties in the way of accepting Dr. Bonham Carter's explanation of the cause of the pulmonary syndrome, not least of which is the constant pathological finding of pulmonary congestion in these babies, suggesting no lack of capillary erection. You also emphasise in your leading article that hyaline membrane is not found in babies exsanguinated from blood-loss.

1. Jaykka, S. *Acta pædiat., Stockh.* 1957, **46**, suppl. 112.
2. *Cold Spr. Harb. Symp. quant. Biol.* 1954, **19**, 102.

The difference between our views is crucial in the prevention of the pulmonary syndrome. Dr. Bonham Carter and his colleagues advocate delayed ligation of the cord to enable an additional volume of blood to reach the baby, because they believe it will help to increase the cardiac output and initiate expansion of the lungs. I advocate it in order to keep the low peripheral resistance of the placenta "in circuit" and thus prevent any dangerous rise in pulmonary artery pressure.[3] At the same time I believe the administration of intragastric oxygen will enable the respiratory centre to initiate respiration with the cord still intact.[4]

The techniques advocated by Dr. Bonham Carter have been carried out at some centres for many years and, although a reduction in the incidence of the pulmonary syndrome has been claimed,[5] complete prevention has not been achieved. It is now proposed to carry out clinical trials embodying these techniques together with immediate administration of intragastric oxygen in premature deliveries and cæsarean sections. If this does not provide the answer, we shall have to think again.

Department of Child Health,
Welsh National School of Medicine. R. J. K. BROWN.

SIR,—We have been working on convulsive and allied syndromes in newborn thoroughbred foals at Newmarket during the past two years, and we were very interested in the papers by Dr. Bonham Carter and Dr. Gunther and your leading article of June 29, and by the earlier paper by Dr. Bonham Carter and his colleagues,[6] because there seem to be striking similarities between some of the conditions occurring in the human baby and the thoroughbred foal. By coincidence, or otherwise, these are the only two species which usually give birth to their young indoors and subject to human assistance or "interference," especially in so far as the umbilical cord is concerned.

About 2% of thoroughbred foals at Newmarket develop violent convulsions within minutes or hours of birth, or become aimless "wanderers," quite unaware of their mother or of the world around them. Many of the convulsive foals emit a curious yapping noise for a short time early in the syndrome; as a consequence they are referred to by laymen as "barkers." With careful management most of the "wanderers" and about 50% of the convulsive cases recover and are left with no residual effects whatsoever. In both, there is no association with infection, and the biochemistry, as far as serum mineral levels, sugar, and urea are concerned, is normal. The major pathological changes in the convulsive cases are seen in the lungs (as is so in "cerebral irritation" in human babies). The main process is a very widespread atelectasis, often, but not always, with considerable exudate. Hyaline membranes are not seen.

For a considerable time we have been greatly concerned with the possibility that the syndromes are associated with very early severance of the umbilical cord. We have found during an investigation of 61 parturitions that this practice may deprive the newborn of anything up to 1500 ml. of placental blood, which is probably more than 25% of the normal blood-volume, and this in a species which is relatively mature at birth and which is normally very active a short time afterwards.

It seems more than a coincidence that, as far as we can verify, the syndromes do not occur in thoroughbred foals which are born unattended in open paddocks in Australia, but are well known in France and Italy, where the cord is always severed by attendants within seconds of birth. Further, in Europe the disease seems to be unknown in breeds of horses other than thoroughbreds and these generally foal without human "interference." Other domestic species which give birth to their young alone, and "naturally," are similarly unaffected. These facts have all been dealt with in two of our papers, at present in press.

Meanwhile, we cannot help wondering whether both the foal syndromes and some of those in human babies are not essentially man-made.

Equine Research Station,
Newmarket. L. W. MAHAFFEY.

March House,
Newmarket. P. D. ROSSDALE.

3. Brown, R. J. K. *Lancet*, 1957, i, 163.
4. Brown, R. J. K. *Ibid*, p. 1039.
5. Strang, L. B., Anderson, G. S., Platt, J. W. *Ibid*, p. 954.
6. Bonham Carter, R. E., Bound, J. P., Smellie, J. M. *Ibid* 1956, ii, 1320.

REFLECTIONS ON MEDICAL TRAVEL

SIR,—Like Professor Witts (June 29), we enjoyed his visit. No-one in the Far East will take his remarks unkindly, for we are only too painfully aware of deficiencies.

What is to be done? The great shortage is in physicians and nurses. Locally trained personnel are, as yet, far too few to cope with needs. Yet today, in the name of anticolonialism, governments discharge expatriate officers from their service. Even if they wanted to, is there any hope of a Dutchman getting a job in Indonesia or an Englishman in Malaya? While patients go untreated, those who could heal them are excluded by the vain pride of politicians remote from the ordinary men and women who just want their pain relieved.

Visiting experts from the World Health Organisation (seldom staying over two years) do not take the place of physicians and nurses willing and anxious to give longer service. Sometimes the expert has what amounts to an interesting holiday, taking up much of the time of those who have to lead him about; and, unless he is a most remarkable person, at the end he still is not really thinking in local terms (he scarcely knows the language). At best he is interpreting problems in terms of his own culture.

Thus underdeveloped countries are falling between two stools—anticolonialism and short-term expertism. What is wanted is men and women who would serve for five to ten years, not just as advisers but as working practitioners. If petty nationalism requires that these men and women should come under the banner of the United Nations, cannot the rules of international organisations (limiting the stay of experts to two years) be altered? What is wanted is service, as well as advice; and continuity, instead of flying visits.

All this may seem old-fashioned; but missionaries and the colonial services *did* serve (and treat). Until there is a sufficient local staff, a modernised missionary colonial service is needed.

EXPATRIATE.

EPILEPSY, MIGRAINE, AND SUBARACHNOID HÆMORRHAGE

SIR,—Your annotation of April 6 draws attention to this diagnostic triad as typical presenting features of intracranial angiomas. You support the view that these lesions when diagnosed should be treated surgically. This attitude is surely uncritical; advice as to radical treatment should be based on a comparison of the results of surgery with those in untreated cases, bearing in mind mortality, morbidity, and response of symptoms to medical treatment.

In a study at the Mayo Clinic,[1] 23 patients with cerebral arteriovenous anomalies were not treated surgically. Their fate compares favourably with reported operative series. 2 died (8·7% compared with 11·7% in Olivecrona and Riives's series [2]), both in their first attack of subarachnoid hæmorrhage.

Convulsions were all well controlled by medication; in 2 of 5 patients with severe headaches these ceased spon-

1. Svien, H. J., Olive, I., Angulo-Rivero, P. *J. Neurosurg.* 1956. **13**, 381.
2. Olivecrona, H., Riives, J. *Arch. Neurol. Psychiat.* 1948, **59**, 567.

taneously. In 5 cases of stationary or progressive hemiparesis, the site of the lesion suggested that radical surgery would certainly also have resulted in hemiparesis: this was probably also the case in patients with epilepsy. Mental deterioration developed in 1 patient only, who had gross hypertension.

A correct attitude to the management of these cases can be based only on comparative studies of this kind. Meanwhile, your suggestion that angiography should always be considered even in migraine must be interpreted as a provocative overstatement.

Department of Neurology,
Government Hospital,
Tel-Hashomer,
Israel.

J. BRAHAM.

TOBACCO AND LUNG CANCER

SIR,—The report of the Medical Research Council on this subject is of too serious significance to be lightly dismissed.

It nevertheless seems a curious thing that, as far as my experience goes, no life-insurance firm makes any inquiry regarding this in their questionnaire. After all, an important part of the business of insurance actuaries is to assess the influence of habits on the expectation of life, and up till now they do not appear to have drawn any special attention to this particular one.

Clifton, Bristol 8.

CHARLES CORFIELD.

ÆTIOLOGY OF PRE-ECLAMPSIA

SIR,—I should like to reply to Dr. Smyth's letter of June 1.

Apart from the clinical evidence that the uterine tension is raised in hydramnios, Alvarez and his colleagues [1] have lately described their researches which support this view. They have found that the uterus "displaying high contractility," in the absence of overdistension, has a considerably higher tonus than one with low contractility; and that the effect of overdistension by hydramnios, although somewhat raising the tone in the low contractile type, in the highly contractile type of organ "raises the tonus very much." It is evident, therefore, that hydramnios does provoke the increased tone which I claimed can accompany it and serve as stimulus for the uterorenal reflex.

I have already supplied direct and indirect evidence that the uterine tone is heightened in toxæmia. Parviainen,[2] in his examination of the relative uterine tone in toxæmic and in normal pregnancy, found it raised in the toxæmic patient. The indirect evidence is extensive: the increase in circulating adenosine,[3] the diminished circulation in the uterine wall, and the clinical improvement after the release of the amniotic fluid, all indicate that in pre-eclampsia the tone of the myometrium is increased.

Again, the relationship of toxæmia to anuria, revealed, inter alia, when intravenous saline is given in anuria, demonstrates its connection with concealed accidental hæmorrhage in which the essential factor of a raised uterine tension is both present and demonstrable as cause of the renal failure. Prophylactic and therapeutic methods in toxæmia that are construed as abolishing the uterorenal reflex include Theobald's [4] extensive denervation of the uterus in the essential hypertensive, and spinal anæsthesia [5]: their efficacy can be explained by their interruption of the stimulus originating in the uterine wall. Again, Acosta-Sison [6] has drawn attention to the association of the height of the uterus in hydatidiform mole with the severity of the toxæmia—a finding that can also be interpreted, if the implications of regression [7] are borne in mind, as evidence of the ætiological significance in toxæmia of increased myometrial tension.

All these findings point to heightened uterine tone in the ætiology.

1. Caldeyro-Barcia, C., Pose, S. V., Alvarez, H. *Amer. J. Obstet. Gynec.* 1957, **73**, 1238.
2. Parviainnen, S., Lankinen, S., Soiva, K. *Gynaecologia, Basel*, 1951, **132**, 19.
3. Green, H. N., Hopewell, J. D., Threlfall, C. J. *Brit. med. J.* 1951, ii, 571.
4. Theobald, G. W. *Ibid*, 1953, i, 422.
5. Hingson, R. A. *Curr. Res. Anesth.* 1947, **177**, 238.
6. Acosta-Sison, H. *Amer. J. Obstet. Gynec.* 1956, **71**, 1279.
7. Reynolds, S. R. M., Baker, J. T. *Contr. Embryol. Carnegie Inst.* 1951, **34**, publ. 592.

Stanjo [8] has much evidence to show that distension of any hollow organ causes acute vascular disturbances in other parts of the body—a finding that supports my thesis. Further, Dr. Saltoun and Dr. Kinn, in their article of June 22, have described anuria supervening on eclampsia—an unusual though possible happening on which I commented recently (May 18), attributing it to the raised tone of the uterine muscle. Saltoun and Kinn have ignored this consideration, while seeking and rejecting all other factors serving jointly to explain the occurrence of eclampsia and concomitant renal failure. At one stage in their discussion they approached the concept of the uterorenal reflex by envisaging that renal ischæmia, based on spasm of renal arterioles and capillaries, could have been responsible for the anuria. In parenthesis, it should be remarked that they failed to realise that toxins damaging the kidneys play no part in the anuria of pre-eclampsia—a fact that Oliver's [9] nephron dissections confirm.

Dr. Saltoun and Dr. Kinn do not seem to appreciate that leakage of glomerular filtrate through the tubular wall could not account for the anuria [10] which results from suspension of glomerular filtration. Their perplexity in this particular case of renal breakdown after anuria, *where liver function was also noticeably disordered*, can be resolved by the recent work of Fajers [11] on the "hepato-renal syndrome" in which lesions of the ischæmic type characterised by tubulorhexis (i.e., destruction of the basement membrane of the tubule) were seen in the kidney of one side when it was exposed to ten minutes' renal ischæmia, and when liver necrosis was already present. Neither liver necrosis alone nor 10 minutes' renal ischæmia alone was capable of producing such grave histological changes in the kidney. In the case reported by Saltoun and Kinn there is a clinical counterpart of this experimental study, and it would be reasonable to regard the renal breakdown as an extreme renal ischæmic reflex response, reinforced by the liver state—with the stimulus to the reflex, as I have already argued, arising in the uterine wall. In this connection it should be mentioned that Crowson and More,[12] by temporary occlusion only (the equivalent of vascular spasm) of the porta hepatica, have produced renal changes of an ischæmic type. Also, at a meeting of the section of medicine at the Royal Society of Medicine earlier this year, the increased severity of an anuric episode when liver disease was a concomitant received much emphasis.

Evidence is accumulating that ischæmia is responsible for the renal pathological changes in anuria and for the filtration failure causing suppression of urine. Renal damage by toxins is not apparent in the nephron dissection of the occasional anuric kidney of eclampsia. The spasm of the renal vessels in this state can therefore be based only on a nervous stimulus. For its production, both in toxæmia and in concealed accidental hæmorrhage, the resistance of the myometrium to stretch suffices as explanation, as I have shown.

Mr. Nichol (July 6, p. 47) also draws attention to anuria superimposed on eclampsia, and in this case two facts deserve comment.

The big diuresis soon after the three days' suppression denies Saltoun and Kinn's suggestion that the anuria may be due to tubular leakage of urine—a result of the ischæmic damage—since sufficient time could not have elapsed for the lesions to heal.

The second and more interesting point is the hæmoglobinuria accompanying eclampsia. Pappenheimer and Kinter [13] suggested that a mechanism of red blood-cell skimming enables the kidney to effect its hæmodynamic control; and that in this process there is a postglomerular circulation in which extensive packing of red cells can occur, in proportion to the sieving, in the "short circulation" (which is a part of the postglomerular circulation). When this mechanism is considered side by side with the hæmatologist's explanation that one of the sites of red-cell destruction is the kidney, a very significant correlation becomes evident, especially with severe grades of the Pappenheimer process. This skimming of the renal blood can be dependent on renal arteriolar constriction, and when renal cortical ischæmia (e.g., by the uterorenal

8. Stanjo, P. Personal communication, 1957.
9. Oliver, J., MacDowell, M., Tracy, A. *J. clin. Invest.* 1951, **30**, 1305.
10. Sophian, J. *Lancet*, 1953, ii, 885.
11. Fajers, C. M. *Acta path. microbiol. scand.* 1956, **36**, fasc. 4, 235.
12. Crowson, C. N., More, R. H. *Arch. Path.* 1955, **60**, 73.
13. Pappenheimer, J., Kinter, W. B. *Amer. J. Physiol.* 1956, **185**, 377.

reflex) is severe, considerable packing of red cells at these sites can occur, and possibly contribute to hæmolysis.

It may well be that a reduction in the circulation sufficient to produce hæmolysis within the kidney is insufficient for glomerular filtration: if so, that would explain the association of hæmolysis and anuria. (A much more severe renal shutdown would account for anuria alone if the "short circulation" were depleted.)

London, W.1. JOHN SOPHIAN.

EXAMPLE IN MOSCOW

SIR,—The medical officer of Her Majesty's Embassy in Moscow, a post advertised in your issue of July 6, must, if married, submit to a restriction which is, I suggest, unjustifiable: he must have "preferably not more than 1 child."

This encouragement of only-children, with all its disadvantages both to child and parents, is unworthy of the employer and is in addition a very poor exemplification of the British way of life in an important setting—to wit, the U.S.S.R.

Birmingham, 14. P. R. KEMP.

SUBUNGUAL HÆMATOMA

SIR,—The recent correspondence on this subject leads me to believe that some of your readers may not be aware of the possibilities for the drainage of this condition by chiropody.

The majority of registered-medical-auxiliary chiropodists have, as a standard piece of equipment, an electric drill which is primarily used upon nail conditions. The burrs are of steel, carborundum, or diamond and in such a variety of shapes and sizes that it is difficult to conceive of any hæmatoma which could not be drained efficiently—even one underlying an onychauxis.

Having had such a procedure carried out on myself, I can testify from both ends of the drill that this apparatus provides a speedy, clean, and quite painless evacuation of subungual blood.

London, N.12. R. R. SUVARNA.

AN "OUTBREAK" OF CORONARY-ARTERY DISEASE

SIR,—Dr. Zeitlin and Dr. Melinek (June 29) ask about other outbreaks of coronary insufficiency.

Last year I reported [1] 9 cases of coronary thrombosis seen in general practice. These were seen within three months, and 7 within twenty-five days. In none was a preceding influenzal illness noted.

Teng and Heyer,[2] who cite other observations, analysed the relation between sudden changes of weather and the onset of myocardial infarction, over a five-year period in which 1386 cases were seen: they recognised an increased frequency during periods of sudden inflows of polar and of tropical air masses, and concluded that sudden meteorological changes have an adverse effect on patients with coronary-artery disease.

Climatic variation in the London area (although subjectively alarming) is not of the same order as in Dallas, Texas; but I thought it worth while to inquire from the Meteorology Enquiry Office, at Harrow, what in fact were the climatic variations at the time of the outbreak described in my paper, and that described by Dr. Zeitlin and Dr. Melinek. It appears that there was considerable variation of temperature at the beginning of November, 1955, and in the middle of March, 1957, but by no means of the same order as that described in Teng and Heyer's paper, where a variation of 36°F was taken as significant!

Perhaps, then, the ætiology of "epidemics" of coronary-artery disease must be sought for in other than infectious causes.

London, N.W.10. KENNETH SANDERS.

1. Sanders, K. *Practitioner*, 1956, **177**, 317.
2. Teng, H. C., Heyer, H. E. *Amer. Heart J.* 1955, **49**, 9.

AN EPIDEMIOLOGICAL STUDY OF MONGOLISM

SIR,—Dr. Pleydell (June 29) has put forward evidence of spatial and temporal grouping of cases of mongolism. As is pointed out in your annotation, Dr. Pleydell's results might well be due to chance and are not conclusive evidence of grouping. I should like to suggest that, even if spatial grouping had been demonstrated, this would not by itself have been evidence of maternal infection. For, as Dr. Pleydell mentions, mongolism occurs more often in the lower social classes. This factor will, by itself, cause some spatial grouping of mongolism owing to the tendency of members of the same social class to live in the same neighbourhood. In order to implicate another factor, it would have to be demonstrated that the degree of grouping was greater than that expected from this cause.

Department of Social and Preventive Medicine, University of Manchester. M. G. BULMER.

A THOUSAND CHAMBER POTS

SIR,—Among the many horrors of modern life, not the least is, when staying in other people's houses, and hotels, to find no chamber pot. Thirty years ago, this was almost as unthinkable as being asked to sleep on the floor. When Dr. Munro and Mr. Williamson tell us (July 6) that "it was decided that patients could be allowed normal lavatory facilities" and the chamber pots were removed, they mean that the patients, getting out of a warm bed, now have to creep through the cold and the dark to a distant lavatory. For Stanley Royd Hospital, a straight leap to *1984*.

Bristol. GEORGE L. ALEXANDER
Colonial Medical Service, retd.

ANTICOAGULANT TREATMENT FOR CORONARY DISEASE

SIR,—Your leading article of June 29 implies that if a patient suffering from coronary disease is to have anticoagulant treatment he must be admitted to hospital, since otherwise prothrombin control cannot be carried out. This is not universally correct: in this town some practitioners treat such patients at home, either asking the pathologist to take the blood for the prothrombin estimation or else themselves taking the blood and bringing it to the laboratory; the result of the test is telephoned a few hours later and if desired advice regarding the dose of anticoagulant is given.

In addition to the services of a pathologist, the practitioner can obtain the advice of a consultant physician and if necessary an electrocardiogram without cost to the patient, whether he is private or not.

There is much to be said for treatment at home if conditions are suitable; the patient prefers it, pressure on hospital beds is eased, and the family doctor is enabled, as Dr. Leeson (June 29) so wisely counsels, to fulfil his true function. It is a sad commentary on the working of State medicine—in many ways so excellent—that it is so geared that there is every incentive for the practitioner to send his State patient to hospital and none except for the satisfaction of work well done, for him to keep him at home. The patients I have referred to were all private patients.

There is a possible benefit of anticoagulant therapy you do not mention: experimental evidence suggests that prolonged anticoagulation tends to promote recanalisation of thrombosed arteries [1] which become functionally active [2]; and with other measures that may lessen [3] the lesions of atherosclerosis long-term benefits may result.

Pathology Department, Worthing Hospital. R. AIDIN.

1. Wright, H. P., Kubik, M. M., Hayden, M. *Brit. med. J.* 1953, i, 1021.
2. Snow, P. J. D., Morgan Jones, A., Daber, K. S. *Brit. Heart J.* 1955, **17**, 503.
3. Aidin, R. *Lancet*, 1956, i, 447.

Parliament

The Law and Mental Disease

Mr. J. K. VAUGHAN-MORGAN, parliamentary secretary to the Ministry of Health, opened the debate in the House of Commons on July 8 by congratulating the Royal Commission on their work. He could not yet make any statement of the Government's views on the commission's recommendations, almost all of which required detailed discussion with local authorities and hospital authorities. This applied to recommendations which might not require new legislation just as much as to those which would. He had asked all those authorities, the professional associations, and the other bodies interested, to let the Ministry have their views by the end of September.

The principles underlying the report were, he thought, in accord with recent trends in the mental-health services and the growing enlightenment of public opinion. Since the end of the war there had been a remarkable expansion in local-health-authority services for care and aftercare along the lines now endorsed by the Royal Commission. The most dramatic developments had been among the services which take care of children, and in the provision of training centres for the mentally defective. In 1948, the number receiving training was 4000. Today it was 15,000. But over 8000 reported suitable for training were not yet receiving it. Another new and promising development was the arrangements made to take a mental defective into hospital temporarily to help the family over a crisis, or just to have a holiday.

When it came to the local-authority services for the mentally ill, it was not so easy to point to any obvious developments, but more was being done along familiar lines. Until 1948 this side of the local authorities' work had been centred by the local authorities on their own mental hospitals, and since the break which took place then they had had to develop their own services with a shortage of staff and in fields which, at least in their preventive aspects, were still largely unexplored. Home visiting by welfare workers, either as part of aftercare or to deal with early signs of mental disturbance, was the main instrument. Under the Royal Commission's recommendations, the main new scope for local authorities would lie in the provision of residential care for suitable mental patients, either under the National Assistance Act or under the National Health Service Act. The implications were far-reaching.

Turning to the hospital services, he pointed out that admissions had increased from 59,000 in 1949 (37,000 of them being voluntary patients) to 88,000 in 1956, including 69,000 voluntary patients. Much of this increased work had to be done in unsuitable buildings. What type of hospital for the mentally ill or mentally defective would be needed in the future? Much treatment, and this would apply increasingly, now took place outside the conventional designated hospital. The number of mentally ill outpatients had gone up by nearly half since 1949, and the number of domiciliary visits by hospital specialists to such patients had more than trebled in the past seven years, all of which indicated the pattern of development for the future.

The waiting-list for admission to mental-deficiency hospitals was admittedly a black spot. It was over 7000 in 1954, dropping down now to just over 6000. The commission's proposal that local authorities rather than hospitals should be responsible in future for providing homes for those who no longer need continuous nursing and psychiatric care would, if acted on, have far-reaching effects on the organisation of the hospitals. Though the amount of treatment had increased out of all measure, we still had much to do to fill the gaps in the ranks both of medical and of nursing staff. There was still a serious shortage in psychiatric consultant staff; we were paying the price of the isolation and separation in the past of this branch of medicine. The Ministry's general policy was to strengthen the medical staff in the senior grades first, and to provide for an increasing number of consultants in the future by increasing and improving the intake to the senior-registrar grade. There were now nearly half as many psychiatric consultants again as in 1949, whereas the number of consultants in all specialties in the hospital service had increased by a little over a quarter. There was also heartening evidence of an improvement in the recruitment of nurses, particularly shown by a 20% increase last year in the number of student mental nurses. In no part of the mental-health services was there any question of stagnation or complacency; nor was there any lack of hope.

THE DWINDLING STIGMA

Dr. EDITH SUMMERSKILL said by following the commission's recommendation to entrust more of the care of the mentally ill to the local authorities we should at last be departing from the old concept of institutional treatment of mental illness. But would the ratepayers be prepared to play their part in this important social development? The clinics and the workshops which would be needed for these patients would be expensive. She would like to have some assurance about the financing of this part of the service.

The commission had suggested that no legal definition of their new category of the psychopathic personality should be attempted; but Dr. Summerskill believed that if we were to recognise this category officially, and allow it to confer even limited powers of compulsory detention, there was reason for a wide definition comprehensible by an intelligent person.

Mr. CHRISTOPHER MAYHEW sympathised with Dr. Summerskill's uneasiness about the definition of psychopaths, for the commission's recommendation would create a new legal right to detain people, sometimes of high intelligence, who had committed no crime. But though the recommendations would change the form and the law they would not really change the practice as much as might be expected. Already the law was being stretched and strained to such an extent that many of these psychopaths were being certified. The position was unsatisfactory and he was glad that the commission had drawn attention to it. He himself felt less inhibitions in restricting the liberty of the young people under 21, as the commission proposed, for the sake of their training and health, than in restricting the liberty of an adult.

But he hoped we should not get bogged down in disagreements about terminology. The report, he thought, tended to overemphasise the importance of terminology and the legal position as a cause of the stigma which mental illness still carried. The real opportunity to lessen the stigma lay in the development of community care, where we could destroy the isolation of the mental illness and bridge the gulf between the mentally ill, in their vast remote hospitals, and the rest of the world. Perhaps the greatest support of the stigma was the spectacle of some of our ugly overcrowded wards, and nothing could do more to remove it than a steady stream of people coming out of our mental hospitals restored to health.

In his view we were not spending nearly enough on research. It was said in defence that there were not enough ideas, but new ideas did not grow in a vacancy. We must create a climate in which young men would

choose mental-health research as their career. We must offer fellowships and scholarships at the universities and insist that our medical students before becoming general practitioners should study psychiatry.

THE LOCAL AUTHORITIES' JOB

Mr. KENNETH ROBINSON welcomed the reduction in compulsion, but he was doubtful about the recommendation that hospitals should no longer be ordered to receive a patient. Was it safe to give hospitals the right to turn away patients who urgently need treatment? In general hospitals there had been the unfortunate consequence of hospital after hospital turning away patients needing treatment. It was an unhappy coincidence that the idea of putting responsibility for the community services on the local authorities had come at a time when the Government were deciding to cut down the central grants. He saw no hope of the local authorities carrying out these recommendations in the spirit in which the commission made them unless they were given considerable encouragement, including financial encouragement by the central Government.

Sir KEITH JOSEPH reminded members that local authorities were being asked to expand community care for the physically as well as the mentally disturbed. They faced "a mammoth job." Furthermore, they already supervised more than half the mental defectives of the country. The matter was further complicated because not all of them agreed with the recommendations of the commission. He hoped that consideration would be given to correlating local-authority boundaries with those of regional hospital boards.

Mr. A. BLENKINSOP saw the local authorities as the key to the problem. Unless we could get them to agree to take over some of these responsibilities for welfare and care, particularly of the elderly patients and also for some of the younger ones, it was impossible to see how we could make real progress towards the level of hospital treatment which we knew was possible, but which it was physically almost impossible to provide so long as nurses had to labour against crowded and difficult conditions. It would be unfortunate if we were to start to encourage the local authorities to develop these services at the moment when specific grants were to be discontinued and only general grants for all purposes offered them.

GOVERNMENT REPLY

Mr. R. A. BUTLER, the Home Secretary, replying for the Government, said that the object of the debate was to give the first opportunity for consultation with the House of Commons. They also wanted further consultation with the local authorities and all concerned before they decided whether the immense area of delegation recommended by the commission were advisable. But the Government thought that, on the whole, they were behind the commission in this. It depended partly, of course, on finance; but the local authorities, he was sure, were ready for the job. The Government were prepared to face the major and minor tasks of the transfer to local authorities, but he could not give a guarantee in which session legislation would fall. He also unreservedly accepted the recommendation of the commission for a revision of the law, and that it should be broadly on the lines indicated in the report. The Government wanted a little time because they must bring in the community, the authorities, and Parliament, and they must have opinion with them—otherwise they could not make a success on the broad majestic scale that the commission's report demanded. If they were given a little time, he assured the House that the time would be most thoroughly used.

Medicine and the Law

A Hand is an Organ

A MAINTENANCE assistant, aged 66, caught the fingers of his left hand in a grinding wheel and sustained injuries to his index and middle fingers. He claimed benefit under the National Insurance (Industrial Injuries) Act, 1946, and a medical board which examined him decided that a loss of faculty had resulted from the accident. The board assessed the disablement resulting from this loss of faculty as 3% for life. Some eight years earlier the workman had suffered an injury to the middle finger of his right hand, but in making their assessment of 3% the board had taken no account of the disablement which arose from the first accident. The workman appealed to the Medical Appeal Tribunal at London on the ground that the medical board were wrong in failing to take into account the disability arising from the earlier injury, and contended that the assessment should have been made in accordance with the provisions of regulation 2 (5) of the National Insurance (Industrial Injuries) Benefit Regulations, 1948. That provides, among other things, that where a person suffers an injury to an organ of his body which in a person whose physical condition is normal would be one of two similar organs, the functions of which would be interchangeable and complementary, then in assessing the extent of the disability arising from the accident any disability in respect of which the person was suffering by reason of an earlier accident should be treated as having been incurred as a result of the relevant loss of faculty. The appeal tribunal rejected this contention on the grounds that the fingers concerned were not "organs" and, even if they were, their functions were not interchangeable or complementary. The workman applied to the Divisional Court for an order of *certiorari* to quash the tribunal's decision on the ground that there was a manifest error of law on the face of the decision. Mr. Rodger Winn, for the tribunal and the Minister, said that the Minister welcomed this opportunity of obtaining a guide on the point as tribunals had taken differing views.

The LORD CHIEF JUSTICE, giving judgment, said that a finger was part of a hand and it was necessary to consider whether a hand was an organ. If a hand was an organ an injury to a finger would be an injury to an organ because of the fact that a finger was part of a hand. The *Oxford Dictionary* defined "organ" as "a part or member of an animal or plant body adapted by its structure for a particular vital function, as digestion, respiration, excretion, reproduction, locomotion, perception, etc. . . ." "Locomotion" seemed to include feet. "Hand" was defined as "The terminal part of the arm beyond the wrist consisting of the palm and five digits forming the organ of prehension characteristic of man." Hands were therefore organs of prehension which enabled grip to be applied to an article and fingers were part of a hand; further their functions were interchangeable and complementary within the meaning of the regulations.

Mr. Justice BYRNE agreed.

Mr. Justice DEVLIN also agreed, but said that he had entertained some doubts because in ordinary language a hand would be considered as part of a limb rather than an organ, and the section of the regulation made no mention of limbs. That might have been a deliberate omission. Arms and legs might well be governed by different considerations.

The court allowed the application and quashed the decision of the tribunal.

Regina *v.* Medical Appeal Tribunal at London. Ex parte Burfitt.—*Queen's Bench Division (Divisional Court)*; Lord Goddard *C.J.*, Byrne and Devlin *JJ.* June 28, 1957. David Turner-Samuels (W. H. Thompson): Rodger Winn (Solicitor, Ministry of Pensions and National Insurance).

G. D. BLACK
Barrister-at-Law.

Public Health

Smallpox

THE Tottenham boy who was found to have smallpox after admission to St. Ann's General Hospital on June 23 [1] died on July 5 in an isolation hospital at Dartford, Kent; and on the same day a 76-year-old woman from Walthamstow, who had recently been admitted to the hospital with unconfirmed smallpox, also died. The boy's aunt is in the same hospital with confirmed smallpox and was reported on July 8 to be "fairly comfortable." [2] A girl of 11 is also under observation at Dartford. On Monday a suspected case of smallpox was reported from Oldham, Lancashire, where a 2-year-old girl has been detained in hospital in Bury.[3] So far investigations have revealed no connection between the suspected case at Oldham and those confirmed at Walthamstow.

It is believed that a man living in Wembley may have brought back the infection from a visit to Nigeria. After his return three months ago his half-brother died of what was thought to be acute leukæmia. Post-mortem specimens were examined at the Prince of Wales Hospital, Tottenham, where the dead boy's grandmother worked. The grandmother was also admitted to the isolation hospital and has now recovered.

During last weekend about 1000 people were vaccinated at the emergency centre at Walthamstow Town Hall; and at Brixton prison, where one of the prisoners is thought to have been a contact, everyone has been vaccinated and "open" visits (those in which no barrier separates prisoner and visitor) have been suspended.

Poliomyelitis

Uncorrected notifications of poliomyelitis for the week ended June 29 (the 26th week of the year) were as follows (previous week in parentheses): paralytic 73 (61), non-paralytic 46 (44), total 119 (105). The weekly total is below the corresponding figures for 1950 and 1953, though the total for the year so far is still higher than for any of the preceding nine years.

Year	*Total cases up to and including 26th week*	*Cases in 26th week*
1948	681	38
1949	554	81
1950	1235	160
1951	807	87
1952	809	90
1953	1017	126
1954	673	54
1955	576	73
1956	833	81
1957	1391	119

Influenza

A statement from the World Health Organisation last week said that the first influenza outbreaks in Europe this summer had been reported from the Netherlands and Czechoslovakia. In the Netherlands the epidemic was spreading rapidly and the virus was definitely identified as A/Singapore/1/57, which had caused the recent epidemics in Asia. The outbreak started in a girls' school in Bussum, near Amsterdam, and had now reached Naarden, Utrecht, Rotterdam, Amsterdam, and Egmond. The number of cases was said to be high, particularly in schools. In Czechoslovakia, the statement continued, three strains of virus A had been isolated and shown to be different from any A strain previously identified there; but direct comparison with the Asian virus had not yet been completed.

Other reports reaching W.H.O. indicated that the epidemic was abating in parts of Asia, but had spread east to Netherlands New Guinea. On its westward course, influenza was now also reported to be in Teheran, Bahrein, Kuwait, Aden, and the Yemen. On page 93 a correspondent describes his experiences in Bangalore.

The Netherlands minister of social affairs and public health has since been reported [3] as saying there was no influenza epidemic in the country. There were only a few harmless cases, such as appeared in any hot summer.

The troopship *Empire Orwell* which docked at Southampton on July 5 had 208 cases of "Asiatic influenza" on board during her voyage from Singapore.[4] All the cases were confined to men on the troop-deck and none had been serious.

Answering a question in the House of Lords on July 8, the Earl of Onslow said that laboratory tests had confirmed that 4 persons who arrived in this country with influenza had the Asiatic type; but there was "no indication at present of any material spread" in this country. A vaccine designed to protect against the strain of virus was now being produced on a laboratory scale. It was being tested for efficacy and the results would be known shortly. It should not be assumed, Lord Onslow added, that vaccination would necessarily be an appropriate measure for general use.

1. See *Lancet*, July 6, 1957, p. 48.
2. *Times*, July 9, 1957.
3. *Ibid.*
4. *Ibid*, July 6, 1957.

Infectious Diseases in England and Wales

Disease	Week ended June 1	8	15	22	29*
Diphtheria	1	4	8	4	4
Dysentery	740	657	458	496	464
Encephalitis:					
Infective	4	3	5	8	4
Post-infectious	1	3	1	4	6
Food-poisoning	176	197	125	226	228
Measles, excluding rubella	21,722	23,339	21,793	22,305	17,417
Meningococcal infection	26	26	15	16	18
Ophthalmia neonatorum	29	38	36	28	22
Paratyphoid fever	9	2	3	7	2
Pneumonia, primary or influenzal	321	326	308	312	252
Poliomyelitis:					
Paralytic	42	48	41	61	73
Non-paralytic	25	26	42	44	46
Puerperal pyrexia	246	214	185	245	215
Scarlet fever	691	590	548	358	436
Smallpox	..	..	..	..	2
Tuberculosis:					
Respiratory	646	591	469	630	553
Meninges and C.N.S.	6	8	7	10	5
Other	87	78	66	74	66
Typhoid fever	6	4	7	3	3
Whooping-cough	1807	1529	1371	1598	1554

* Not including late returns.

Obituary

GERALD ROCHE LYNCH

O.B.E., M.B. Lond.. F.R.I.C.

As senior official analyst to the Home Office, Dr. Roche Lynch gave evidence in many well-known murder trials, and among his own profession he was also known for his work as director of the department of chemical pathology at St. Mary's Hospital. He retired from these appointments about three years ago, and he died on July 3 at his home at Slough, at the age of 68.

Gerald Roche Lynch came of a long line of doctors, and his father, Dr. Jordan Roche Lynch, was in practice in Kensington. He was educated at St. Paul's School and passed his matriculation at London University in 1905. In that year he began his studies at St. Mary's Hospital Medical School, where, in 1906, he gained one of the entrance scholarships in natural science. He gained the prize in chemistry and from that time he showed a natural aptitude and bent for that subject. While taking his medical course he also studied chemistry at the City and Guilds Institute under Prof. H. E. Armstrong, and, while still a student, became demonstrator in chemistry in the medical school. At that time Dr. (afterwards Sir William) Willcox was lecturer, and thus began a notable association between the two. In 1913 Lynch graduated M.B. from London University and also took the Apothecaries' licence.

During the war of 1914–18 he served in the Royal Navy and in 1919 he was appointed O.B.E. Though he filled the post of house-physician at St. Mary's Hospital he did not show much interest in clinical medicine, but took a post as demonstrator in the department of pathological chemistry. He was appointed director of that department in 1926 and continued as its chief till he retired in 1954. In 1924 he was appointed junior official analyst at the Home Office as assistant to Sir William Willcox, and in 1928 he became senior official analyst. In this capacity he gave evidence in many famous trials. He was accurate and precise in his manner of giving evidence and his opinions were always based firmly on the observed facts.

He filled many important offices in connection with his special subjects. He lectured on forensic medicine at St. Mary's Hospital Medical School from 1936 to 1954, and at Westminster Hospital Medical School from 1924 to 1945. He examined in forensic medicine at London University and at the examinations of the Royal College of Physicians. He also examined for the Institute of Chemistry. He was president of the Society of Public Analysts (1936–37), of the Medico-Legal Society (1939–41), and of the Royal Institute of Chemistry (1946–49). He was made a member of the Poisons Board in 1933, and acted as Privy Council Visitor to the examinations of the Pharmaceutical Society in 1943. He was made an honorary fellow of the City and Guilds Institute.

Z. C. adds:

As his offices show Roche Lynch was a busy man, but he also found time for other interests. He was devotedly attached to the Society of Apothecaries, of which he was a past master. He was a keen gardener and specialised in the growing of carnations. He delighted in the mechanisms of clocks, and horology was one of his hobbies. (The students used to sum up his interests as—crime, carnations, and clocks.) He found little time for, and apparently cared little for, ordinary social functions, and took little part in the committee work of hospital or medical school, but he was a prominent member (and a director) of the Medical Sickness Society.

He was a friendly man, naturally reserved but able to talk wisely and well on any subject in which he was interested. He was one of those who greatly helped the development of pathological chemistry and he interested many generations of students in that subject.

Of Roche Lynch's forensic work K. S. writes:

He made so many appearances in coroners' and assize courts in his long career that his name will inevitably be linked in the minds of the English public with his tenure of the post of senior analyst to the Home Office. He was undoubtedly a fine analytical chemist, no mean serologist, and a dour witness into the bargain—an excellent partner for Spilsbury. He was the last official analyst to the Home Office, succeeding Willcox, and counting J. H. Ryffel as his "junior." This small team bore the weight of the scientific evidence in innumerable criminal trials before the days when forensic science laboratories made their appearance, and well indeed did Roche Lynch come out of this prolonged and exacting test of his qualities.

He was entirely happy in his laboratory at St. Mary's and always ready, if "at home," to accommodate yet another set of jars or clothing on his already hopelessly overcrowded benches, to discuss another case, and to appreciate its intricacies with his ready grasp of essentials. Affable if a little distant, he was intolerant of stupidity, and police officers did not relish orders to deliver materials to his laboratories. He understood their problems, however, and was a consistently sound servant of the Crown in problems ranging from murder by arsenic to the grouping of salivary stains on discarded cigarettes from scenes of housebreaking.

Co-examinership with him in London gave an excellent idea of his comprehensive grasp of the whole field of legal medicine, and many a doctor will have vivid recollections of the well-groomed silver-haired figure, pink carnation in button-hole, who put him through the forensic hoop in his M.B. Roche Lynch was a character from an older school, a man of integrity whose strong authority one did not question; though not ambitious, he was nevertheless determined to make his subject felt in the field of criminal law, and in this he succeeded uncommonly well, achieving respect from the Bench and the Bar and leadership in his own branch of the profession. His name will survive him in the annals of British toxicology.

Dr. Roche Lynch's wife died many years ago and he is survived by a married daughter.

IVAN WILLIAM HAROLD MANSFIELD

M.R.C.S.

Dr. Mansfield, who was on the staff of Whipps Cross Hospital for many years, died in New Zealand on April 15, at the age of 54. He qualified from the Middlesex Hospital in 1930, and after holding a number of house-appointments he joined the staff of Whipps Cross Hospital in 1932. His twenty years' work there was interrupted only by military service during the late war. Though he did not specialise in any particular subject he had considerable ability in many branches of medicine, and he was a skilled anæsthetist. For some years he assisted in the treatment of staff at the hospital. In 1952 he left England to settle in New Zealand, where he was appointed medical superintendent and director of medical services at the Hokianga hospital and for the Hokianga district. In this capacity he had many opportunities of making contact with the Maori people. They appreciated his deep sympathy and profound understanding, and he established himself as their friend. He spent much time in the study of Maori history and culture. He leaves a widow.

ALEXANDER HENRY EDWARDS

M.B. Edin., F.R.C.S.E., F.R.F.P.S.

Mr. Alexander Edwards, who died in a Paisley hospital last month, was for many years a member of the surgical staffs of the Western Infirmary and the Royal Infirmary in Glasgow. He was one of the pioneers of orthopædic surgery in the West of Scotland and he was the last survivor of the group of Glasgow workers who, under Macewen and later Hogarth Pringle, made a special study of bone injury and disease—especially of dislocation of the hip and fractured skull.

Edwards graduated M.B. with first-class honours from the University of Edinburgh in 1896, and held a resident appointment at Glasgow Royal Infirmary before he went abroad to serve in the South African war. He returned to Glasgow, where he held an assistantship in obstetrics at St. Mary's College and a surgical post at the Western Infirmary. He took the F.R.C.S.E. in 1902. But though nominally attached to the Western Infirmary, he spent the greater part of his time with Hogarth Pringle, and he acted as Pringle's private assistant for several years. On Pringle's advice in 1911 he spent over a year in Vienna at the Allgemeines Krankenhaus working with Lorenz. He took the diploma in orthopædic surgery of the University of Vienna and returned to Glasgow full of fresh ideas about his new specialty. Unfortunately the war cut short his research work and instead he spent some rather unhappy years at Stobhill Hospital. When Bellahouston Emergency Hospital was opened he was put in charge of the orthopædic department and he held this post till the unit was closed. In 1948 he retired to live at Kilmacolm.

J. A. G. B. writes:

My first meeting with Edwards was in the early years of the century when he was assisting Pringle in a slightly clandestine study of the mechanism of skull fracture—the abundant material being supplied by the unearthing of an old cholera cemetery during building extension. He still had a rather military appearance and manner, following his South African war experience, but was very kind and indulgent to a very junior assistant. He was a fresh, sincere character with a voluminous knowledge of surgical literature. Up till five years ago, I had many communications from him—all on the possible errors in various accounts of surgical pathology and procedure. Like his chief, he had no hobbies save reading. In 1953, Glasgow set its seal of approval on his life's work by conferring on him an honorary fellowship.

Dr. G. P. McCULLAGH

H. R. V. writes:

I first met Graham McCullagh at Royal Naval Hospital, Haslar, in early 1940 and I served with him for several years. As in all Services, it was inevitable that there was a certain amount of friction between the "Regulars" and the "Reserves," but in Haslar any such friction was quickly dispelled, largely by McCullagh's influence, and as a result Haslar became an extremely "happy ship." Others have written of his skill as a pathologist, we saw his skill as an administrator when he took over the difficult and thankless job of Passive Defence Officer. But it is as a member of the mess that we will all remember him. A talented musician, playing most instruments, he organised a small orchestra to play tea-shop music and a dance-band to play for mess parties. His witty sketches and parodies enlivened hospital concerts and his film *True Blue Harold* must be a happy memory for many.

It is one of the compensations of war that one is able to meet and live with men like McCullagh. His quiet personality must have made a life-long impression on many who, but for the war, would never have known him. All who served with him must feel a great personal loss at his untimely death.

Notes and News

WORK AT THE LISTER

THIS year's report from the Lister Institute [1] is printed in a new and far more readable form. Much of the diverse work recorded cannot be described more briefly, and we must content ourselves with mentioning a little of it.

E. Klieneberger-Nobel, with the assistance of D. H. Card and W. A. Blyth, is collaborating with clinicians in a study of the ætiology of non-specific urethritis. In a substantial proportion of cases, the genital tract harbours a peculiar type of pleuropneumonia-like organism. This was recovered in 32% of males, and 90% of females, with acute gonorrhœa, and in 47% of males and 81% of females with acute non-gonococcal urethritis, vaginitis, or cervicitis; but in a large number of patients with other pathological conditions it was rarely found. Incidentally, L. H. Collier has observed that some stock lines of human carcinoma cells (Hela strain) maintained in different laboratories are contaminated with pleuropneumonia-like organisms, which do not, however, produce gross cytopathogenic effects.

The possibility of preparing smallpox vaccine in tissue-cultures is being studied. D. McClean, C. Kaplan, and L. R. Thomas have obtained virus titres of about 10^8 infectious units per ml. from cultures of chick-embryo cells.

I. N. Asheshov and E. Hall Asheshov are continuing their investigations on anti-phage substances produced by actinomycetes, in the hope that these may prove useful in the study and control of animal viruses. As there is evidence that rutilantins, produced by an actinomycete, have a significant action on influenza virus in the chick embryo, they are being produced on a larger scale in purer form in conjunction with the Medical Research Council's antibiotic research station at Clevedon, Somerset.

B. G. F. Weitz and F. Lee-Jones have continued their study of the natural feeding habits of tsetse flies, in the course of which 5000 blood meals were identified during the year. Also, about 50,000 identification tests were made on mosquito stomach contents, chiefly on behalf of malaria control schemes.

Further observations on the substances that increase capillary permeability have been made by D. L. Wilhelm, A. A. Miles (director of the institute), E. M. Sparrow, and P. J. Mill. The last-named has noted that inflammation induced by chemical irritants develops faster than inflammation induced by ultraviolet irradiation, and that the response to chemicals, unlike the response to ultraviolet light, is inhibited by an anti-histamine drug. Work by Professor Miles on non-specific immunity is outlined.

Attempts by W. d'A. Maycock and P. A. Turner to demonstrate, in rabbits, the formation of antibodies to dextran of low molecular weight have been unsuccessful, but the serum of volunteers injected subcutaneously with 1·0 mg. of highly purified dextran with a molecular weight of about 1 million showed increases of nitrogen, precipitable by dextran, of the order of 20–50 μg. per ml.

S. Haq has developed a method whereby derivatives of glucose can be made to polymerise. The chemical synthesis of glycogen-like polysaccharides is in progress.

A section of particular clinical interest deals with work on a potent antihæmophilic factor derived from human plasma, whose separation and clinical trial have been described by R. A. Kekwick and P. Wolf in this journal (March 30, 1957). For some time to come, supplies are likely to be very small, and responsibility for allotting them will rest with the Medical Research Council's hæmophilia committee.

L. Vallet and R. H. Painter have recovered useful quantities of fibrinogen from plasma separated from outdated blood. This can be given in cases of fibrinogenopenia associated with premature separation of the placenta, long-standing intra-uterine fœtal death, or amniotic-fluid embolism. Considerable supplies were prepared and used during the year.

HOSPITAL ADMINISTRATION

IN the belief that better understanding of the hospital service was urgently needed, and in the hope that a comparative study would throw light on the nature and problems of large-scale organisation in general, the Acton Society Trust authorised in 1951 a study of "Hospital Organisation and Administration under the National Health Service." The investigation has been planned and carried out by Prof. T. E. Chester, and the results are to be published in a series of six studies. The first, "Background and Blueprint," was published in December, 1955, and the second, "The Impact of the Change," in August, 1956. The third and fourth studies are now published together as parts I and II of a paper on "Groups, Regions and Committees."[1] This paper has been written up after the publication of the report of the Guillebaud Committee and its practical evidence supplements some of the findings of that committee. It also discusses some aspects of the administrative organisation of the hospital service on which the committee barely touches. Useful comparisons are made between the hospital service in England and Wales and that in Scotland.

In part I, a summary of the history and objectives of regionalisation and grouping leads into an examination of the great variation in the size and scope of the responsibilities of hospital management committees, the composition of these committees, and the implications of the Guillebaud Committee's recommendation that regional hospital boards should consider splitting up some of the large groups and amalgamating some of the small ones. A section is devoted to the management structure of the group and to the duties and personal relationships of the appointments of group secretary, finance officer, and supplies officer. An analysis of the work of twelve H.M.C. secretaries shows that on average 37% of total time is spent on paper work, 32% on discussions, interviews, &c., and 18% on committee work. Other sections examine the effect of grouping on the representation of the medical viewpoint and on the provision of nursing services.

Part II is concerned with the functions, membership, and staffing of the regional hospital boards. A regional comparison of board membership shows that there is no rigid uniformity of pattern, and in some instances there is a departure from the original intention to limit cross-membership between H.M.C.s and boards. Interesting comments are made on the considerable differences in the establishment and committee structure of the R.H.B.s, and on the relationship between the secretary and the senior administrative medical officer. The functions of the R.H.B., first as a planning authority and secondly as a supervisory authority, are examined at length. A further section looks at the question whether teaching hospitals should be merged into the regional hospital administration.

A later pamphlet will deal more fully with the problems of the men and women working in the hospital service.

University of Cambridge

Dr. J. S. Mitchell, F.R.S., whose appointment as regius professor of physic is announced on another page, at present holds the chair of radiotherapeutics at Cambridge.

Dr. Mitchell, who is 47 years of age, studied medicine at Cambridge and Birmingham, graduating M.B. Camb. in 1934. After tenure of a Beit fellowship at the colloid science laboratory in Cambridge, he became in 1937 resident radiological officer at the Christie Hospital, Manchester. The same year he obtained the PH.D. degree. In 1938 he returned to Cambridge and became assistant in research in radiotherapy in the department of medicine. During the late war he worked as a radiotherapist in the Emergency Medical Service. In 1943 he took the D.M.R. and was appointed director of the therapeutic centre at Addenbrooke's Hospital, Cambridge. The year 1944–45 he spent in Canada, where he was in charge of medical investigations in the National Research Council Laboratory in Montreal. Soon after his return to Cambridge he was appointed to the newly instituted chair of radiotherapeutics. In 1951 he was appointed C.B.E., and he became F.R.S. in 1952, F.F.R. in 1954, and M.R.C.P. last year. His published work includes papers on the mechanism of therapeutic action of radiations. He is a fellow of St. John's College. He is also honorary consultant to the Atomic Energy Authority.

University of Manchester

At recent examinations the following were successful:

Ch.M.—G. R. Carr.

M.B., Ch.B.—B. W. Barnes, Brian Bazeley, George Beaumont, H. D. C. Bell, J. A. Bell, Brian Bethell, Eileen M. Booth, Geoffrey Brooks, P. P. Carter, A. J. Chadwick, Myra Chadwick, Anne G. Cooper, Hugh Dawson, Patricia A. Doran, A. J. Dutton, J. M. Evanson, Joyce M. Eyre, A. W. F. Fisher, Muriel Francis, K. W. Hancock, B. D. Hewitt, L. P. J. Holt, B. D. Hughes, W. R. Lee, L. M. Lines, Maurice Longson, Garry Macdonald, A. W. Marr, J. P. Midgley, Joyce M. Morris, R. W. K. Neill, T. G. Ramsell, Sylvia J. A. Raymond, James Roberts, M. G. Roberts, Barbara J. Rostron, J. A. Rudin, Cyril Salkin, Garrioch Sedman, Montague Segal, Margaret W. Seymour, M. P. Smith, G. A. Steele, Sheilah D. Sutherland, W. E. N. Taylor, Gaynor Thomas, William Wagstaff, J. S. Whittaker, K. S. Williamson, P. A. Yates.

1. Report of the governing body, presented to the annual general meeting on June 27. Obtainable from the Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1.

1. Hospitals and the State: Groups, Regions and Committees. Part I: Hospital Management Committees. Part II: Regional Hospital Boards. Acton Society Trust, 39, Welbeck Street, London, W.1. 4s. each.

University of Durham

On July 6 the honorary degree of D.C.L. was conferred on Sir John Stopford, F.R.S.

University of Leeds

At a recent examination G. C. Turner obtained the degree of M.D.

University of Birmingham

Dr. P. C. Harris has been appointed lecturer in medicine and Dr. K. Brown-Grant lecturer in physiology.

University of Sheffield

Dr. David Verel has been appointed senior lecturer in medicine, Dr. J. D. Acland, lecturer in pharmacology, Dr. A. Bradley, lecturer in forensic medicine. The title of reader in child health has been conferred on Dr. John Lorber, at present senior lecturer in child health.

University of Liverpool

At recent examinations the following were successful:

Ch.M.—Helsby, C. R.

M.D.—Cheetham, H. D., Green, R. I., Lynch, J. B.

M.B., Ch.B.—Baron, Margaret, Carson, J., Jones, R. W., Tracy, Hilda J. (second-class honours); Adamson, L., Animashaun, A., Archer, J. F., Arrowsmith, P., Bennett, J. R., Blenkinsop, P. R., Bunting, P. F. J., Canter, J. L., Capey, Vera J., Cheyne, C., Clark, Doreen, Claytion, W. G., Coates, R. P., Cohen, D., Craig, J. D. H., Craig, J. C., Crosby, N. H., Davies, R. F., Daymond, Patricia W. R., Dittman, R., Evans, A. E. J., Frank, P. I., Frood, H., Gilmore, Patricia B., Goodrick, W. I. M., Gordon, A. C., Gottlieb, M. S., Graham, R. F., Grant, June S., Hajioff, J., Harris, C. M., Harrison, R. J., Hill, M. A., Jones, D. A., Kimmins, B. A. G., Kinsey, R. M., Lavelle, J. O., Lewis, Marina, E. A., Mellors, Jean A., Mills, G. L., Moorhead, J. F., Morris, A. L. R., O'Sullivan, K. F., Owen, D. W., Pryce, Gwenllian J., Reader, J. G., Regan, Marguerita M., Le Riche, Jean C., El-Rifi, M. K. D. H., Sanderson, Isabella, Santer, G. J., Simpson, F. A., Smith, R. J., Thomas, Lesley F., Tongue, Margaret A., Walkden, J. A. D., Walker, K., Webster, J. B. C., Williams, A., Williams, Wendy M.

D.P.H.—Allan, Frances, Cusack, Anne L. J., Danger, G. W., Duthie, L. H., Hobday, T. L., Holt, P. G., Hyde, Marie T., Jones, Brenda, Kirkland, A. L., Lewis, Margaret M., Marren, Dora, O'Malley, J. E., Pattison, D. C., Roberts, D. P. W., Timmis, W. G., Williams Mary P. K.

D.M.R.D.—Brown, J. M., Couch, Audrey, Galloway, R. W., Grainger, K., Locker, C. R.

D.M.R.T.—Bhattacharyya, A., Hughes, H. J., Nopparat, T.

University of Aberdeen

On July 5 the honorary degree of LL.D. was conferred on Prof. A. W. Downie, F.R.S. On July 5 and 6 the following degrees were conferred:

M.D.—W. G. Smith, D. W. Taylor (honours); D. S. Munro (commendation); W. I. Cranston.

M.B., Ch.B.—Dita M. K. Evans, J. H. Wyllie, Derek Ogston (honours); T. M. Forrester, J. W. Norris (commendation); G. E. Adan, Ajibayo Akinkugbe, E. R. Alexander, W. S. Allan, J. T. Anderson, Thomas Ashcroft, Malcolm Bamforth, R. M. Bichan, F. H. Brown, G. L. Chalmers, B. A. Charles, Muriel Clarke, A. B. Coull, Nancy P. Cruickshank, D. P. Cummine, J. F. Davidson, Helen M. Dean, Margaret G. Duguid, Donald Eccleston, David R. Findlay, C. L. Forbes, Elizabeth M. J. Hamilton, G. L. Horsfall, J. McG. Imray, Jean J. Kerr, Elizabeth M. McK. Leslie, G. M. McAndrew, Deirdre C. C. MacArthur, J. S. McCracken, F. G. Macdonald, Joan Macfarquhar, R. W. McIntyre, H. N. Mackenzie, M. L. Matheson, C. D. Mowat, J. A. Murray, C. J. Must, Margaret McK. Philip, D. D. Reid, Doris J. Ritchie, G. C. Shirreffs, F. R. C. Soper, G. S. Sorrie, Gillian Stephenson, R. G. Strachan, A. McL. Thomson, G. H. Vaughan, L. I. Walterson, D. S. Young.

University of St. Andrews

Dr. E. W. Walton has been appointed a lecturer in the department of pathology, at Queen's College, Dundee.

Dr. Walton is a native of Newcastle upon Tyne and was educated at Spennymoor Grammar School, co. Durham, and King's College, Durham University, from which he graduated M.B. in 1949. He has held positions as house-surgeon in the professorial surgical unit, Royal Victoria Infirmary, Newcastle, and as house-physician at Bishop Auckland Hospital, co. Durham. Between 1950 and 1952 he served with the R.A.M.C. and was R.M.O. to the Somaliland Scouts, East Africa. In 1952 he was appointed to his present post as demonstrator in pathology at King's College, Durham University. He took his M.D. degree this year.

University of Dublin

On July 4 at Trinity College, Dublin, the following degrees were conferred:

M.D.—J. H. Biggart (honoris causa); Rupert Indar, I. R. Moore, Eleanor B. Outon.

M.B., B.Ch., B.A.O.—Michael Murray-Alston, A. H. Bakker, F. A. Best, Ruth T. Blackall, D. P. Brattman, R. K. Brennan, Francis Byrne, A. P. M. Cahill, F. E. M. Cahill, H. B. Devlin, Rose A. Fisher, Shirley M. Gittins, Kathleen C. M. Hackett, Ruth M. Harris, Pamela C. Harrison, Ann E. Heatley, Danuta M. Jarosz, C. F. G. Jones, P. T. MacDonnell, W. A. Marshall, J. B. O'Regan, L. C. Prozesky, L. R. Redman, Ronald Shapiro, A. H. Simpson, Hilda A. Stoddart, D. C. Thomas, Eunice V. Turner, A. F. Watson, B. E. White.

L.M., L.Ch., L.A.O.—N. M. Cocks.

University of Glasgow

On July 6, the following degrees were conferred:

M.D.—Bernard Isaacs, J. M. Reid (high commendation); W. M. Fyfe, A. J. Nelson (commendation); D. H. Clark, A. A. Charteris, W. T. Irvine, G. B. S. Roberts, R. S. Ferguson, A. A. McKirdy.

M.B., Ch.B.—D. S. C. Brown, B. M. Rifkind (commendation); Chienyenwa Mercy Abaecheta, R. C. B. Aitken, Morakinyo Adekunle Titilayo Ajao, F. D. Allan, William Allan, K. D. Allardyce, C. J. Allen, Phyllis M. Auchincloss, A. T. K. Baillie, D. McC. Barr, G. F. Berry, T. F. Beveridge, J. P. K. Binnie, I. F. S. Black, G. A. W. Borland, Jean W. Brown, George Buchanan, Margaret E. Burns, D. G. S. Campbell, Ian Capperauld, J. A. Clarke, J. W. Collins, J. P. Colquhoun, Jean L. Cooper, Ann M. Crowder, Alexander Cumming, C. S. Cunningham, D. N. M. Cuthbert, J. H. Dagg, L. J. Davidson, Eileen M. Dixon, Thomas Donaldson, C. N. Donoghue, H. S. Fletcher, Jean H. Fraser, T. L. Fraser, C. A. Gourley, B. W. Grace, B. M. Groden, George Hannah, Ramsay Hannah, A. M. Harper, F. O. Hemming, D. T. Herriot, W. R. Hesson, A. G. Jamieson, Irene R. Jamieson, T. E. Kellie, Michael Kennedy, C. W. Kerr, Catherine C. King, R. W. Logan, Helen P. Macalister, Elizabeth Macaulay, J. A. McBride, E. A. McCabe, Harriet McCallum, Maureen McCann, Ann P. Macfarlane, D. B. McFarlane, Mary W. Macfarlane, Janet McR. McGrath, Fiona M. McGregor, J. H. McKay, Thomas McLean, Margaret S. Macleod, D. L. Macphie, J. D. G. Malley, L. R. Massiah, Ian Maxwell, Susan M. Mechie, M. T. Melling, Agnes McR. R. Menzies, G. C. Miller, Margaret K Miller, Roy Miller, Stanley Miller, Elizabeth Murray, J. N. Norman. James Notman, Kofi Amoa Oduro, Margaret M. O'Neill, W. I. B. Onuigbo, I. G. Philip, David Pollock, Irene J. Robertson, W. A. I Rushford, J. D. Russell, W. B. Russell, James Shields, W. O'N. Shields, Annetta Smith, J. C. S. Smith, M. W. J. Smith, Jessie M. Steele, Sidney Stern, D. J. D. Stevenson, Isabella Stewart, W. A. Stewart, C. D. Strang, D. A. Stuart-Smith, Eileen F. Sweeney, W. S. Syme, W. M. Tait, Mary M. Tannahill, J. C. Taylor, T. R. Taylor, J. S. Templeton, S. A. P. Tindal, G. F. Waddell, Lorna B. M. Webster, Patricia H. R. Welsh, D. R. Westfield, J. A. White, Robert Wilson, C. R. R. Wylie, D. McQ. Yilla.

On June 20 the following diplomas were conferred:

D.P.H.—James Dow, G. C. Franklin, D. C. R. Gemmell, B. J. Green, J. S. Green, Frances M. W. Hamilton, J. L. Hastings, Walter Holmes, Christina C. McEwan, William McIntosh, E. D. Mackie, Patrick McKillop, Robert McLaren, Alastair MacLean, W. J. Patterson, J. D. Terrell, H. L. C. Young.

Royal College of Surgeons of England

On July 4, Mr. A. Dickson Wright, Sir Stanford Cade, and Prof. Digby Chamberlain were re-elected members of the council and Prof. F. A. R. Stammers and Mr. T. Holmes Sellors were elected. The result of the poll was as follows:

ARTHUR DICKSON WRIGHT (St. Mary's Hospital)	1179
STANFORD CADE (Westminster Hospital)	1144
FRANCIS ALAN ROLAND STAMMERS (Birmingham United Hospitals)	1056
DIGBY CHAMBERLAIN (General Infirmary, Leeds)	947
THOMAS HOLMES SELLORS (Middlesex Hospital)	860
Rodney Honor Maingot (Royal Free Hospital)	830
John Cridlan Barrett (Leicester Royal Infirmary)	714
Norman Leslie Capener (Royal Devon and Exeter Hospital)	689
Frank Wild Holdsworth (Sheffield Royal Infirmary)	585
Douglas William Claridge Northfield (London Hospital)	563
Samuel Hall Wass (Guy's Hospital)	522
Ralph Marnham (St. George's Hospital)	416
Arthur John Gardham (University College Hospital)	415
Ronald William Raven (Royal Marsden Hospital)	413

In all 2379 fellows voted; and in addition 23 votes were found to be invalid.

British Association of Urological Surgeons

The following officers have been elected for 1957–58:

President, Mr. Arthur Jacobs; immediate past president, Mr. R. H. O. B. Robinson; vice-president, Mr. Hugh Donovan; hon. treasurer, Prof. Victor Dix; hon. secretary, Mr. J. D. Fergusson; hon. editorial secretary, Mr. David Band; other members of council, Mr. F. R. Kilpatrick, Mr. W. S. Mack, Mr. T. J. Millin, Mr. T. W. Mimpriss, Mr. R. A. Mogg, Mr. D. S. Poole-Wilson, Mr. E. W. Riches, and Mr. J. Swinney.

Royal Australasian College of Physicians

At a meeting of the general body of fellows of the college held in Brisbane on May 29 the following were elected and admitted to the fellowship:

Under article 44: R. R. H. Lovell (Victoria). *Under article 42:* J. L. Adams, J. D. Willis (New Zealand); R. C. Angove, W. M. Irwin, R. A. A. Pellew (South Australia); G. C. de Gruchy, H. J. Sinn (Victoria); G. V. Hall, A. J. May, T. E. H. Spark (New South Wales); H. W. Johnson, W. G. Livingstone, J. H. Tyrer, L. D. Walters, H. G. Wilson (Queensland).

On May 28 the following were admitted to the membership:

N. H. Brooke, D. G. Campbell, D. R. Hay, I. C. Isdale, W. B. Jackson, B. J. Kelly, G. B. Kiddle, R. G. Lawrence, C. M. Luke, C. A. Macleod, D. J. K. North, L. H. Stevens, R. C. Tait (New Zealand); P. D. Breidahl, B. M. King, I. H. McKenzie, M. L. Mashford, P. J. Nestel, H. A. Copeman, N. J. Nicolaides, W. S. Rowe, D. J. Deller, A. H. Gibson, D. J. Harbison, E. J. Lines, A. P. Skyring, R. A. Barter (Australia).

Faculty of Radiologists

At a recent examination for the fellowship the following were successful :

P. E. Bodkin, A. M. H. Fisher, K. E. Halnan, L. Langton, P. E. S. Palmer, J. G. Pearson, F. M. Ramsay, S. D. Roberts, J. G. Sowerbutts, P. D. de Villiers, I. Yentis.

At simultaneous examinations held in Australia and New Zealand the following were successful :

M. D. Begley W. S. C. Hare, K. W. Mead, K. W. Mowatt, M. G. Pinner, J. H. Stewart, P. W. Wishart.

The admission of fellows in Australia and New Zealand was conducted by Dr. Whately Davidson, the president of the faculty, who was the visiting examiner with Dr. John Bromley.

Order of St. John of Jerusalem

The Queen has sanctioned the following promotions in, and appointments to, this order :

As Knight.—W. R. Russell, C.B.E., M.D., F.R.C.P.

As Dame.—Lady Duke-Elder.

As Commanders.—Surgeon Rear-Admiral A. A. Pomfret, O.B.E., M.B., Q.H.S., Lieut.-Colonel S. H. Heard, M.B.E., M.R.C.S., K. D. Bean, M.B., W. E. H. Bull, M.C., M.B., John Prentice, M.B., E. R. A. Merewether, C.B., C.B.E., M.D., F.R.C.P., M. I. Dick, M.B., Marian Maxwell Reekie, M.B.

As Officers.—A. F. McDonald, M.B., H. A. Robertson, M.B., M.R.C.P., D. F. Barrett, M.B., Surgeon Captain D. M. Beaton, O.B.E., L.R.C.P., Q.H.P., Surgeon Commander F. P. Ellis, O.B.E., M.D., M.R.C.P., P. J. Kerley, C.V.O., C.B.E., M.D., F.R.C.P., K. F. Alford, M.B., N. L. Lloyd, C.B.E., M.B., M.R.C.P., Sybil G. Horner, C.B.E., M.B., Ludwig Guttmann, O.B.E., M.D., M.R.C.P. (associate).

Institute of Neurology, London

On Wednesday, July 17, Dr. Morris B. Bender (New York) will give a lecture on the oculomotor system, based on experimental studies in monkeys. On Thursday, July 18, Prof. H. W. Magoun (Los Angeles) will speak on The Waking Brain. On Friday, July 19, a lecture on headache mechanisms will be delivered by Dr. Harold G. Wolff (New York). All the lectures will be held at the institute, National Hospital, Queen Square, W.C.1, at 5.30 P.M.

Conference of Medical Photography

The medical group of the Institute of British Photographers will hold a conference at the Royal Infirmary, Manchester, from Sept. 20 to 22. Mr. Robert Newell, dean of postgraduate medical studies, will open the meeting. Further particulars can be had from the medical secretary of the institute, 38, Bedford Square, London, W.C.1.

French Congress of Medicine

The 31st French Congress of Medicine will take place in Paris from Oct. 16 to 18, under the presidency of Prof. René Moreau. The programme includes discussions on the collagen diseases, malignant endocarditis, and cerebral vascular diseases. British doctors are invited to attend and further information may be had from the secretary general of the congress, Prof. G. Boudin, 8, Rue du Pré aux Clercs, Paris, VII, or from Prof. A. P. Cawadias, 82, Portland Place, London, W.1.

Royal Medico-Psychological Association

This association's annual meeting was held in Oxford, under the presidency of Dr. R. W. Armstrong, on July 2–5. At the dinner, in Christ Church hall, Dr. J. S. I. Skottowe reminded his audience that some years ago the suicide-rate among undergraduates at Oxford and elsewhere had caused some concern, and that it was in Dr. Lowe's vice-chancellorship that steps were taken in Oxford to make advice on mental health more readily available to students. The results had been gratifying. He emphasised that psychiatry was an important part of general medicine, and that current moves to reintegrate the two should be welcome to both. The Very Rev. Dr. John Lowe, dean of Christ Church, was entertainingly reassuring about the mental health of the present-day students. Prof. G. W. Pickering mentioned briefly the links that Christ Church has with the history of medicine. His own realisation of the importance of psychiatry had come in part from his work on blood-pressure in which environmental factors embracing mental reactions were sometimes prominent. The experimental method in the problems of general medicine had already proved its worth ; but as yet, he felt, this method had been little applied in psychiatry and the future held great possibilities for this. Dr. Armstrong also welcomed the growing tendency for psychiatry to move once more within the fold of general medicine and foresaw mutual benefit from the meeting.

Biochemical Society

A meeting of this society will be held in the Washington Singer laboratories of the University of Exeter on Friday, July 19, at 11.30 A.M.

Charterhouse Rheumatism Clinic

On Tuesday, July 16, at 6 P.M., at 54, Weymouth Street, London, W.1, Mr. W. Alexander Law will deliver the Gilbert Scott lecture. His subject will be the Rôle of Surgery in the Treatment of the Rheumatic Diseases.

Royal Society of Health

At the annual luncheon on July 9, Prof. Harold Burrow, the chairman, proposed The Guests. He said that the society's right to invite them was the right of a person 81 years old (or young). Its motto said that the purpose of life was to take care of one's neighbour. Replying, Mr. R. McKinnon Wood, chairman of the London County Council, said that the society had doubled its membership in ten years. He pointed out that, in view of changing views on names it had been right to insist on not being called the Royal Sanitary Institute. Sir Harry Platt, F.R.C.S., felt that to propose the health of The Society was an act of supererogation, and Sir Arthur Massey, in reply, said that people were applying for membership at the rate of one an hour. In the United States things were done on a big scale, but the society's membership outstripped that of the American Public Health Association.

Presentation to Dr. J. K. Rennie

At a complimentary dinner on June 28, a presentation was made to Dr. J. K. Rennie by 83 of his former house-physicians and registrars. Dr. Rennie has been senior physician to Bradford Royal Infirmary and St. Luke's Hospital, Bradford, for 28 years and has now been appointed honorary consultant to the cardiorespiratory unit of the Bradford hospitals.

Presentation to Mr. J. N. Deacon

At a gathering at Edgware General Hospital, Middlesex, on July 3 Mr. J. Fielding, secretary of the Hendon Group Hospital Management Committee, spoke of the thirty years' distinguished service of Mr. J. N. Deacon, who is retiring from the post of medical director, though he is remaining for some time longer as a locum ear, nose, and throat surgeon. No-one, Mr. Fielding said, has done more for the creation and establishment of the hospital than Mr. Deacon. In thanking the staff for the presentation made to him, Mr. Deacon gave a brief history of the growth of the hospital and said he was very proud to be present. A portrait presented by his medical colleagues was on view.

Last month Mr. R. B. Zachary, as a representative of the British Association of Pædiatric Surgeons, attended a symposium in Bratislava on tumours in childhood. Speaking in Czech he expressed the good will of the association to their Czech colleagues and congratulated Prof. Arnold Jirásek, to mark whose 70th birthday the symposium was held.

Appointments

CALDWELL, I. W., M.D. Aberd., M.R.C.P. : part-time consultant dermatologist, North Lincolnshire.

DENBOW, W. E., M.R.C.S., D.P.H. : asst. county M.O., Newton Abbot/Teignmouth area, Devon.

GRIFFITHS, H. H., M.B. Wales : senior casualty officer, Porth and District Hospital.

HOPKINS, C. D., M.R.C.S., D.P.H. : assistant M.O.H. for special families, Bristol.

JENKINS, ANITA J., M.D. Lond., D.P.H. : assistant M.O.H. and school M.O., Swindon.

LAVERICK, R. C., M.B. Leeds : assistant M.O., Bradford.

O'NEILL, M. E., M.B. N.U.I., D.P.H. : asst. county M.O. and school M.O., Staffordshire.

RATCLIFF, R. A. W., L.R.C.P.E. : psychiatrist (S.H.M.O.), Dingleton Mental Hospital, Melrose.

SMYTH, D. A., M.B. Durh., D.P.H. : M.O.H., Edmonton.

VINE, S. M., M.B. Camb., M.R.C.P. : consultant physician in geriatrics, Reading area hospitals.

WATSON, NORVAL, M.B. Glasg., D.P.H. : deputy physician-superintendent, Lodge Moor Hospital, Sheffield.

Births, Marriages, and Deaths

BIRTHS

ELLIOTT.—On July 16, at Brighton General Hospital, to Dorothy (née Hall), wife of Dr. R. I. K. Elliott, a sister for Graham, Charles, and Andrew.

THOMAS.—On June 16, at Cardiff Maternity Hospital, to Anne Thomas (formerly Tighe), M.B., wife of Lewis P. Thomas, F.R.C.S.—a son.

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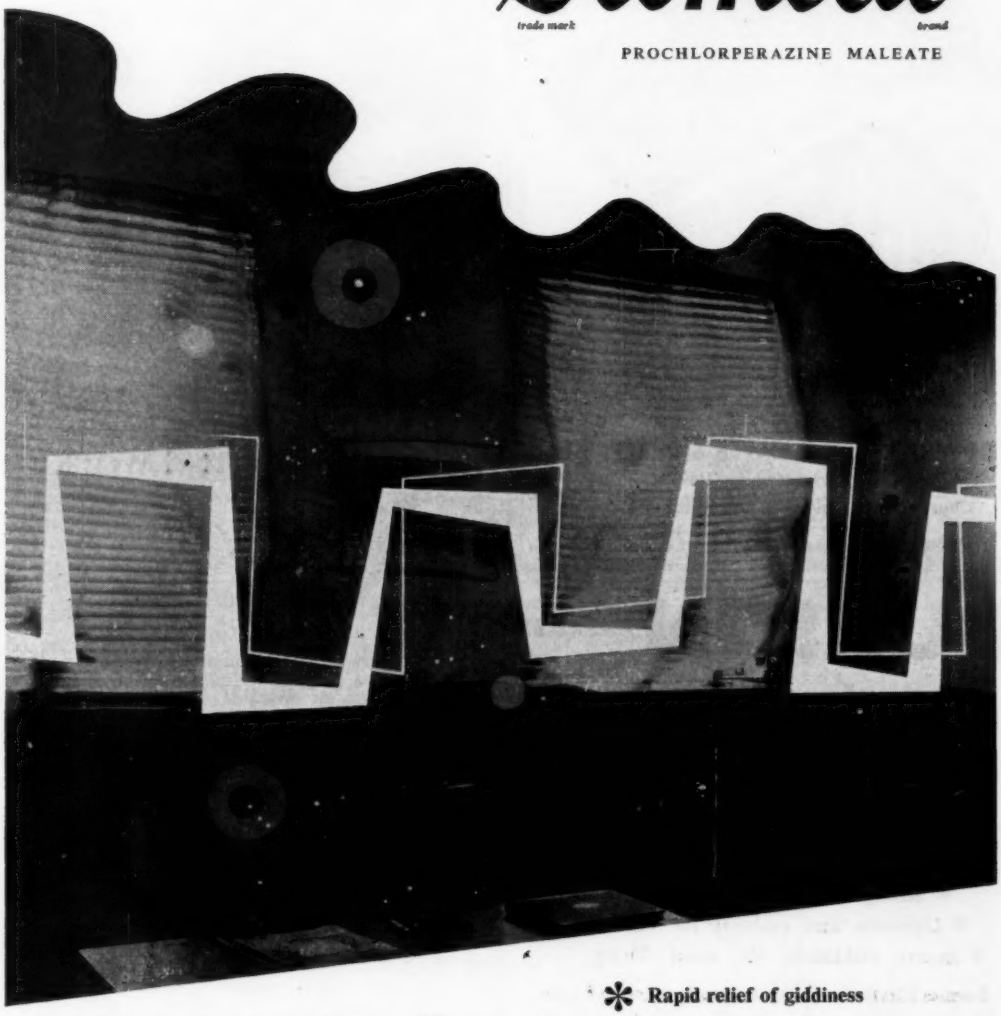

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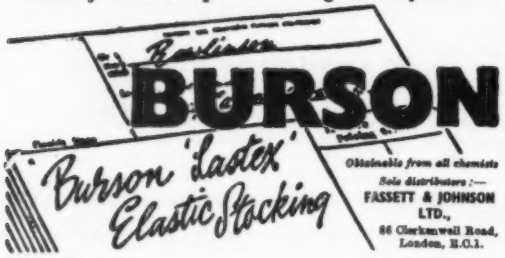

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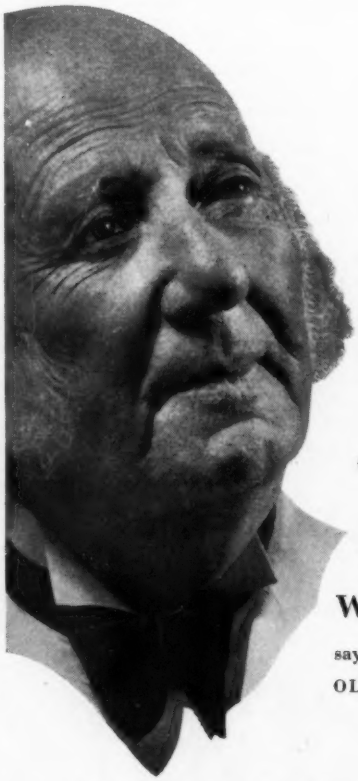

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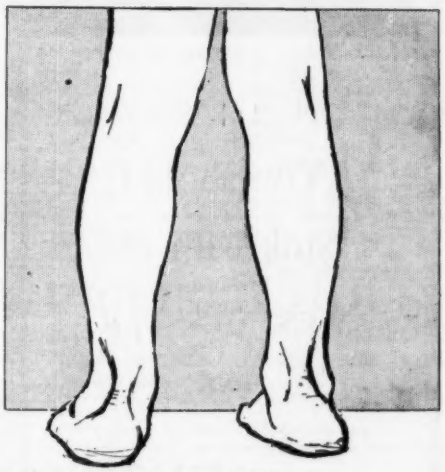

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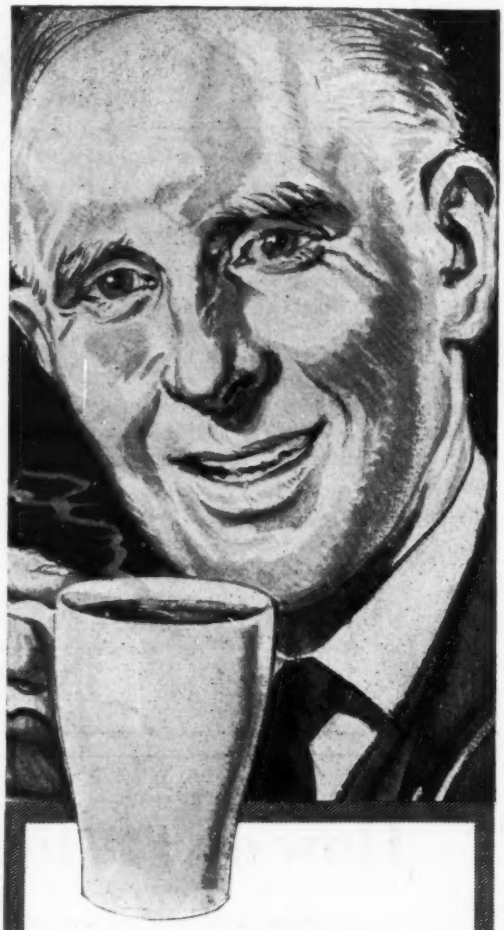

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Academic and Educational

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY

(Incorporating the teaching facilities of Queen Charlotte's Maternity Hospital, Chelsea Hospital for Women and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates with a registrable qualification for enrolment for the AUTUMN TERM (2ND SEPTEMBER–30TH NOVEMBER, 1957). Graduates attend each of the constituent hospitals in turn for clinical work and attend lectures and special demonstrations at all 3 hospitals. Enrolment fee £3. Tuition fee £36 a term.

General practitioners wishing further experience in Obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will have the opportunity of attending the labour ward in addition to combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved general practitioners attending for a period of 2 weeks.

An INTENSIVE COURSE for those preparing for M.D. and M.R.C.O.G. will be held from 2ND DECEMBER to 14TH DECEMBER, 1957.

During the winter vacation a limited number of graduates may attend the practice of the hospital.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

UNIVERSITY OF LONDON

A LECTURE entitled "Dentistry for Children: Histological Background to some Clinical Problems" will be delivered by Prof. M. MASSLER (Illinois) at 5.30 P.M. on 24TH JULY at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF LONDON

A LECTURE entitled "The Transfer of Research Findings in Dental Materials to the Practice of Dentistry" will be delivered by GEORGE C. PAFFENBARGER, D.D.S. (Senior Research Associate, American Dental Association at the National Bureau of Standards, Washington, D.C.) at 5.30 P.M. on 22ND JULY at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

MENTAL HEALTH RESEARCH FUND

STUDENT PRIZES AND TRAVELLING FELLOWSHIP IN PSYCHIATRY

The Mental Health Research Fund awards annually to Medical Students and Doctors in their pre-registration year 3 Monetary Prizes and a Travelling Fellowship as the result of an essay competition on a subject relating to mental health, and a subsequent interview.

Applicants gaining the top 3 places in the essay competition will be given prizes of £100, £50, and £25 respectively.

The Travelling Fellowship, tenable in a Psychiatric or other Department abroad for up to 6 months, will be awarded as the result of an interview combined with consideration of the candidate's undergraduate record. Persons interviewed will be chosen from the top 10 in the essay competition. The Travelling Fellowship will normally be taken up at the end of the pre-registration year or, in the event of it being awarded to a medical student, may be taken up after qualification.

The subject for the essay this year is "The Relative Importance of Nature and Nurture in the Development of Psychiatric Disorder."

The Panel of Examiners consists of 2 members of the Research Committee of the Mental Health Research Fund and 1 member of the Association of Teachers of Psychiatry in Undergraduate Medical Schools.

Essays should be sent, before 1st March, 1958, to the Secretary, Research Committee, Mental Health Research Fund, 39, Queen Anne-street, London, W.1 (Tel.: WELbeck 1272), from whom further details may be obtained.

L.M.S.S.A.

FINAL EXAMINATION: SURGERY, 12th August, 14th October, 11th November, 1957. MEDICINE, PATHOLOGY, 19th August, 21st October, 18th November, 1957. MIDWIFERY, 20th August, 22nd October, 19th November, 1957. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF ABERDEEN. Applications are invited for the CHAIR OF SOCIAL MEDICINE. A medical qualification is required and Consultant Hospital status will be accorded.

Particulars from the Secretary, The University, Aberdeen, with whom applications (20 copies) must be lodged not later than 31st July, 1957. Applicants outside the British Isles may submit 1 copy of application.

THE UNIVERSITY OF MANCHESTER. Department of CHILD HEALTH. Applications are invited for the full-time post of LECTURER IN CHILD HEALTH. Salary scale £1300–£100–£2150 p.a., according to qualifications and experience. Membership of the F.S.S.U. and Children's Allowance Scheme.

Applications should be sent not later than 20th July, 1957, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF EDINBURGH. Department of Psychological Medicine. Applications are invited for the post of LECTURER in the Department of Psychological Medicine. The salary scale, with effect from 1st August, 1957, is provisionally fixed at £900–£100–£1900 p.a. Placement in the scale will be given according to qualifications and experience. The post is subject to superannuation, and family allowance is payable where applicable. The person appointed will be expected to take up duty on 1st October, 1957, or as soon thereafter as possible. The successful candidate, who must hold higher qualifications, will work in the Professorial Units of the Department at the Jordanburn Nerve Hospital and at the Royal Infirmary of Edinburgh, at which he will hold honorary appointments as Senior Registrar. Sound experience in general medicine, neurology or pædiatrics will compensate for shorter experience in psychiatry.

Further particulars may be obtained from the undersigned, with whom applications (6 copies) together with the names of 2 referees, should be lodged not later than 19th August, 1957.

CHARLES H. STEWART, Secretary to the University.

July, 1957.

UNIVERSITY OF EDINBURGH. Department of Therapeutics. Applications are invited for the post of LECTURER in the Department of Therapeutics. The salary scale, with effect from 1st August, 1957, is provisionally fixed at £900–£100–£1900 p.a. Placement in the scale will be given according to qualifications and experience. The post is subject to superannuation, and family allowance is payable where applicable. The successful candidate will be expected to take up duty on 1st October, 1957, or as soon thereafter as possible.

Further particulars may be obtained from the undersigned, with whom applications giving the names of 2 referees, should be lodged not later than 17th August, 1957.

CHARLES H. STEWART, Secretary to the University.

July, 1957.

BRITISH TUBERCULOSIS ASSOCIATION RESEARCH COMMITTEE. Scholar required for 1 year in the first instance to assist in the organisation of a controlled trial of corticosteroids in pulmonary tuberculosis to be centred at Harefield Hospital, Harefield, Middlesex. Experience in the treatment of pulmonary tuberculosis and if possible the use of corticosteroids. Salary according to qualifications up to £1500 p.a.

Applications for further particulars should be addressed to the Administrative Secretary, British Tuberculosis Association, 59, Portland-place, London, W.1.

GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1. Applications are invited for the post of JUNIOR LECTURER in the Department of Morbid Anatomy and Histology. Appointment to date from 1st October, 1957. Salary in the scale of £900–£100–£1100 with F.S.S.U. and family allowance. Preference will be given to a candidate with an Honours Degree in a Basic Medical Science.

Forms of application are obtainable from, and should be lodged with, the Dean, not later than 25th July, 1957.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street (Gower-street), London, W.C.1. Applications invited for JUNIOR LECTURESHIP IN ENTOMOLOGY for 2 years in first instance, with possibility of extension. Salary £850–£50–£1050 a year, plus £60 London allowance and family allowances.

Applications, stating age, qualifications with dates, and previous experience, should be sent to the Dean as soon as possible.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL (University OF LONDON), London, S.W.1. Applications are invited for the post of LECTURER IN BACTERIOLOGY. Salary scale £1150–£1750, with additional children's allowances and F.S.S.U. benefits. Applicants should hold a medical qualification and have had a general training in the field of pathology and/or bacteriology.

Applications, with the names of 2 referees, should reach the Secretary by 31st August, 1957.

Hospital Services: Senior Appointments

LAMBETH GROUP HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for a Locum CONSULTANT GERIATRICIAN at the South Western Hospital, Landor-road, Stockwell, S.W.9. The appointment is for up to 7 sessions per week.

Applications to the Group Secretary, Renfrew-road, S.E.11, quoting names and addresses of 2 referees, by 26th July, 1957.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD.

(1) CONSULTANT SURGEON (3 half-days a week), Royal Northern Hospital, Holloway-road, N.7 (279 Beds).

Applications before 12th August, 1957.

(2) ASSISTANT PATHOLOGIST (whole-time), Senior Hospital Medical Officer grade, King Edward Memorial Hospital, Ealing, W.13, and associated hospitals. Duties include Public Health Laboratory work and general practitioner service for surrounding area.

Applications before 15th August, 1957.

(3) ASSISTANT PSYCHIATRIST (whole-time), Senior Hospital Medical Officer grade, St. Bernard's Hospital, Southall, Middlesex (2507 Beds). Considerable experience in diagnosis and treatment of mental illness essential.

Applications before 21st August, 1957.

(4) CONSULTANT ANÆSTHETIST (4 half-days a week), Thoracic Surgical Unit, Clare Hall Hospital, South Mimms, Barnet, Herts. Applications for 2 half-days a week will be considered and candidates should indicate whether they are able to undertake 2 or 4 half-days.

Applications before 23rd August, 1957.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Applications are invited for the post of Whole-time CONSULTANT RADIOTHERAPIST. The successful candidate will be responsible for isotope therapy; considerable experience in this field is essential.

Applications, stating age and giving full details of qualifications and experience, together with names of 3 referees, should reach the Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 10th August.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the appointment of Part-time ASSISTANT SURGEON (Consultant) to the Royal Free Hospital, Gray's Inn-road, W.C.1. Applicants must be Fellows of the Royal College of Surgeons (England). Salary and conditions of service in accordance with those laid down by the Ministry of Health.

Applications, giving details of experience and accompanied by the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 17th August, 1957.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of CONSULTANT PHYSICIAN in Physical Medicine (part-time). 5 or 6 sessions a week.

Applications (1 copy), stating age, qualification and details of experience, and the names of 3 referees, to be addressed to the House Governor by 13th August, 1957.

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum Senior CASUALTY OFFICER (Senior Hospital Medical Officer grade) required from 22nd July for 3 weeks.

Apply, giving full details including names of 2 referees, to Group Secretary at above address immediately. (0362.)

LEEDS REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at De la Pole Hospital, Willerby, near Hull (1100 Beds). Residential accommodation available if required.

Applications (12 copies), stating age, qualifications and details of appointments held with dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 9th August, 1957.

REVISED ADVERTISEMENT

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT in Pædiatrics (9 notional half-days per week) for duties at hospitals in the Dewsbury, Batley and Mirfield Group with additional duties as may be required at hospitals in the Pontefract, Wakefield, Huddersfield and Halifax Areas. Duties also required at the School Clinic, Dewsbury. The person appointed will be required to reside in Dewsbury or within such a distance thereof as may be laid down by the Board.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary to the Board, Park-parade, Harrogate, by 9th August, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) in the Group Laboratory at Hope Hospital, Salford. Successful candidate will work under general guidance of a Consultant and facilities are available for gaining experience in all branches of hospital pathology. Appointee to live in or near Salford.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 29th July, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of Locum SENIOR HOSPITAL MEDICAL OFFICER in Pathology to the South Manchester Hospital Management Committee for 9 weeks, commencing October, 1957, or a Locum REGISTRAR in Pathology for 12 weeks commencing October, 1957. Duties divided between Withington Hospital Laboratory and Wythenshawe Laboratory, and would include all branches of clinical pathology except biochemistry.

Applications, with the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MEDWAY AND GRAVESEND HOSPITAL MANAGE-MENT COMMITTEE. Locum CONSULTANT ANÆSTHETIST required during August and September for a total of approximately 50 sessions. Salary according to grading.

Applications to Group Secretary, 20, Star-hill, Rochester, Kent, stating experience, names of 2 referees, and dates available.

NEWCASTLE REGIONAL HOSPITAL BOARD. Con-SULTANT ANÆSTHETIST, whole-time or maximum part-time (minimum 9 notional half-days per week) for Gateshead Group of hospitals—main hospitals: Queen Elizabeth (176 Beds), Bensham General (230 Beds), Dunston Hill (300 Beds).

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointment:—

Lansdowne Clinic, Glasgow

CLINICAL DIRECTOR.

The Clinic provides for the outpatient treatment of patients suffering from psychoneuroses. The Director, who will be a Consultant, will be responsible for the overall running of the Clinic and for the supervision and training of Junior Psychiatrists in individual and group psychotherapy. The post is part-time and the number of sessions will be determined in the light of any other commitments which candidates may have.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT, Crichton Royal Mental Hospital, Dumfries. A higher medical qualification is essential. The appointment will be whole-time or on the part-time basis of 9 sessions per week.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. NORTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the part-time post of CONSULTANT GENERAL SURGEON (8 notional half-days per week) on the staff of the Aberdeen General Hospitals.

Applications (12 copies), together with the names of 2 referees, should be forwarded by 26th July, 1957, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. NORTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the whole-time post of SENIOR HOSPITAL MEDICAL OFFICER to the Regional Tuberculosis Service. The main duties will be at Tor-na-Dee and Glen o' Dee Sanatoria (152 Beds) but will also include work in the Regional Chest Clinic. There is an active Thoracic Surgical Unit at Tor-na-Dee and applicants should have experience in pre- and post-operative care of cases. Residence will be required at or near Tor-na-Dee, which is 6 miles from Aberdeen. Single accommodation is available in the Sanatorium.

Applications, giving the names of 2 referees, should be submitted by 19th July, 1957, to the Secretary, North-Eastern Regional Hospital Board, Scotland, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited to fill a vacancy for a CONSULTANT ANÆSTHETIST (part-time, 9 notional half-days a week) to the Eastbourne Group of hospitals. Candidates must have had wide experience in anæsthetics and hold the appropriate qualification. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 27th July, 1957.

NEW ZEALAND. WAIKATO HOSPITAL, Hamilton, NEW ZEALAND. Applications are invited from suitably qualified medical practitioners of the British Empire for the position of Full-time ORTHOPÆDIC SURGEON at the above Hospital. Preference will be given to applicants possessing postgraduate degrees. Salary in accordance with the Hospital Employment (Medical Officers) Regulations as either:—

(*a*) Senior Registrar £NZ1010–£NZ1170 plus an allowance of £NZ200 in lieu of residence, or

(*b*) Junior Specialist £NZ1640–£NZ1940 (non-resident).

An allowance will be paid on arrival, towards travelling expenses incurred, in travelling to take up appointment.

Conditions of appointment and form of application are available from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Applications close with the Secretary, P.O. Box 934, Hamilton, New Zealand, Wednesday, 28th August, 1957. A. C. BURGESS, Secretary.

Hospital Services: Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER (post-registration) required in Obstetrics and Gynæcology. Post recognised for M.R.C.O.G. Appointment from 1st August, 1957.

Applications, with 2 testimonials, to Medical Director by 20th July.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR (resident or non-resident) required at above Hospital which accommodates 300 patients suffering from tuberculosis and other diseases of the chest. Post vacant 23rd August, 1957. Hospital may be visited by direct appointment with Physician-Superintendent.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 23rd July, 1957.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE PHYSICIAN required for a period of 6 months. Post vacant 1st September, 1957.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £819 10s. p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. HOUSE PHYSICIAN (pre-registration) required on 4th August.

Applications, stating age, nationality, qualifications and experience with the names of 3 recent referees, should be sent to the Secretary at the above address not later than 20th July.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the appointment of Full-time MEDICAL REGISTRAR for general medicine and pædiatrics. Appointment for 1 year in the first instance to commence 1st September, 1957. Salary in accordance with Ministry of Health scale, for Registrar grades.

Applications, with names of 3 referees, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 17th July, 1957.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited for the 6-month resident appointment of Pre-registration HOUSE SURGEON now vacant, and should be sent to the Group Secretary, Hackney Hospital, London, E.9, quoting GH/PHS.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the 6-month resident appointment, now vacant, of CASUALTY OFFICER (House Officer grade), AND HOUSE SURGEON (E.N.T.).

Apply immediately, Secretary, above address, quoting HH/CO.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the 12-month resident appointment of SENIOR HOUSE OFFICER ANÆSTHETIST. The post, now vacant, is recognised for the D.A. and the F.F.A.R.C.S. examinations, and offers wide experience of anæsthesia, with opportunities to study for higher qualifications.

Apply immediately, Secretary, above address, quoting HH/SHO/A.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON required, vacant 4th August. Duties mainly orthopædic with some E.N.T. and emergency general surgery. New Operating Theatre, Outpatient and Casualty Department. Post recognised for Pre-registration Service.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Required to commence on Wednesday, 14th August, Full-time SURGICAL REGISTRAR (Male). The possession of the Diploma of Fellow of 1 of the Royal Colleges is desirable. Honorarium at the rate of £850 p.a. Appointment will be for a period of 12 months.

Further particulars may be obtained from the Secretary to whom applications, with names of 3 referees, should be sent on or before Wednesday, 31st July, 1957.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st September, 1957, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer, or Registrar, according to qualifications and previous surgical experience.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 17th July, 1957.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre- or post-registration) required for 6 months. Post vacant immediately.

Applications, stating age, experience, &c., and enclosing copies of testimonials, to be sent to the Hospital Secretary.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE PHYSICIAN AND CASUALTY OFFICER, vacant on 15th July, 1957. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE SURGEON (post recognised for F.R.C.S.), vacant on 31st July, 1957. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 6th August, 1957.

Application forms, obtainable from Physician-Superintendent, should be returned by 19th July with copies of not more than 3 testimonials.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of ANÆSTHETIC REGISTRAR (non-resident) at The National Hospital, Queen-square, W.C.1. This post carries the grade of Senior Registrar. The appointment will be for a period of 1 year in the first instance.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 31st August, 1957.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospital, Queen-square, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the full-time appointment of SENIOR MEDICAL REGISTRAR (non-resident) at the Maida Vale Hospital for Nervous Diseases, London, W.9, which is a joint appointment with The London Hospital. The successful applicant will work for the first and third years at the Maida Vale Hospital and the second and fourth years at The London Hospital in the Neurological Department. Senior Registrar grade. Preference will be given to the candidate holding a higher degree who intends to specialise in neurology.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary to the Board of Governors at the Maida Vale Hospital for Nervous Diseases, London, W.9, not later than 3rd August, 1957.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. SENIOR HOUSE OFFICER (Casualty Department), vacant 4th August. Recognised for F.R.C.S. 6 months resident appointment and may then be renewed. Salary £819 10s. p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON, vacant 1st August, 1957.

Applications from provisionally or fully registered candidates, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, to the Hospital Secretary by 16th July, 1957.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of MEDICAL REGISTRAR in the Department of Neurology. Appointment will be graded as Senior Registrar or Registrar according to qualifications and experience.

Forms of application, obtainable from Deputy Superintendent, should be submitted, naming 2 referees, by 31st July.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. Applications are invited from medical practitioners for the post of CASUALTY OFFICER (some anæsthetic duties). Senior House Officer grade recognised for F.R.C.S. Opportunity to serve for a further 6 months as House Physician in same grade.

Applications, with 3 testimonials, to the House Governor, not later than 23rd July, 1957.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICER. Appointment will be made for 2 consecutive periods of 6 months commencing 1st September, 1957. First period (Shadwell) as House Physician and second as House Surgeon (Banstead) and Casualty Officer (Hackney-road).

Application forms may be obtained from the Secretary at Hackney-road, and should be returned with copies of not more than 3 testimonials, not later than 20th July, 1957.

QUEEN MARY'S HOSPITAL, Roehampton, London, S.W.15. (408 Beds.) SURGICAL REGISTRAR required whole-time. National Health Service terms and conditions.

Applications (4 copies), giving nationality, date of birth, qualifications, experience, present appointments and names of 3 referees, should reach the Secretary, Ministry of Health, Division 4 (v), Norcross, Blackpool, Lancs, by 2nd August, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (third post) for 6 months commencing 18th August, 1957.

Applications, with names of 2 referees to Hospital Secretary by 20th July, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. JUNIOR CASUALTY OFFICER (House Officer third post) required for 6 months commencing as soon as possible.

Applications, with the names of 3 referees, to Hospital Secretary by 24th July, 1957.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the appointment of SENIOR REGISTRAR to the Pædiatric Department for work at the Royal Free Hospital and the Hampstead General Hospital. Applicants must be registered medical practitioners of not more than 10 years qualification, and be members of the Royal College of Physicians. The appointment is full-time, non-resident and for 1 year in the first instance. Duties to commence 1st October, 1957. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior Registrars.

Applications, giving the names of 3 referees, should be sent to the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 31st August, 1957.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1, with which is associated the Institute of Laryngology and Otology (University of London). General Practitioner CLINICAL ASSISTANTS and OUTPATIENT ASSISTANTS. These appointments give those engaged in general practice who are able to attend for 2 sessions weekly over a period of 15 months commencing in October, 1957, the opportunity of widening their clinical experience in the specialty. At the end of 3 months training period the holders will be appointed as Outpatient Assistants with remuneration under paragraph 10 (*b*) of the National Health Service terms and conditions of service.

Further particulars may be obtained from the House Governor.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Depart-MENT OF OBSTETRICS AND GYNÆCOLOGY. Recognised for the M.R.C.O.G. Applications are invited for the post of REGISTRAR to the above Department. The post is full-time and resident.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, London, S.W.3, to be returned within 14 days of date of advertisement (enclose foolscap stamped addressed envelope).

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON (resident), post-registration. Post recognised for D.Obst.R.C.O.G. Vacancy late August.

Applications, naming 2 referees, to Medical Superintendent within 14 days of date of advertisement.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. Locum SENIOR SURGICAL REGISTRAR required for 9 months from 1st October.

Applications, stating age, experience, qualifications and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 27th July. (0356.)

ST. JAMES' HOSPITAL, Balham, London, S.W.12. House PHYSICIAN required. Post vacant 13th August.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address, by 24th July. (0363.)

ST. ANDREW'S HOSPITAL, Bow, E.3. Senior House OFFICER (orthopædic, E.N.T. and emergency general surgery) required. Post recognised for 6 months training in general surgery.

Applications, with copy of at least 1 testimonial, to Group Secretary, Bow Group Hospital Management Committee, 2A, Bow-road, London, E.3, immediately.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified practitioners to undertake a half-time research project at the Western Ophthalmic Hospital in the investigation of headaches among patients attending an ophthalmic clinic. The appointment will be for a period of 1 year and remuneration will be at the equivalent rate of a SENIOR REGISTRAR. Candidates should have a psychiatric qualification and preference will be given to those with a higher medical degree.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, within 14 days of the appearance of this advertisement.

ST. MARY'S HOSPITAL, CHILDREN'S DEPARTMENT, PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN, St. Quintin-avenue, London, W.10. HOUSE OFFICERS (2) required (second or third post). Pre-registration candidates considered. Vacant 1st September, 1957, as follows :—

(*a*) Mainly medical.
(*b*) E.N.T. and Casualty.

Recognised for the D.C.H.

Applications, with names of 2 referees, to undersigned not later than 22nd July, 1957. A. C. YOUNG, Secretary.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior HOUSE OFFICER (Casualty, Orthopædic and Fracture Departments), vacant 11th August. Recognised for F.R.C.S. 6 months resident appointment and may then be renewed. Salary £819 10s. p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments as Whole-time REGISTRAR in General Medicine at Dulwich Hospital, East Dulwich-grove, S.E.22, in the Camberwell Group of hospitals, where there is an association with King's College Hospital Medical School, for teaching purposes. The appointments may be resident or non-resident, but if non-resident the successful candidate will be required to sleep in during nights when on duty. No married quarters are available. The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 20th July, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. DARTFORD AND WOOLWICH GROUPS OF HOSPITALS. Applications are invited for an appointment as REGISTRAR in Anæsthetics, involving special duties with Positive Pressure Respirators in the Poliomyelitis Units at the Brook Hospital, Shooters Hill-road, S.E.18, and Joyce Green Hospital, Dartford, commencing at the latter hospital on 1st October, 1957. Rotating duties will be arranged between the 2 units during the normal 2-year tenure. Experience in general anæsthetic duties and with the Neuro- and Thoracic Surgical Units at the Brook Hospital will be available also. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 27th July, 1957.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from Women medical practitioners for the post of MEDICAL REGISTRAR (7 sessions weekly), vacant shortly. The appointment is normally for 2 years but subject to review at end of first year. Canvassing will disqualify but candidates are not precluded from visiting the Hospital.

For forms of application apply to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed forms should be returned not later than 27th July, 1957.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (Senior House Officer) required for Bearsted Memorial Hospital, Lordship-road, N.16, and at The Green, Hampton Court, for 6 months commencing 1st September, 1957. Posts recognised for the D.Obst.R.C.O.G. Previous obstetric experience an advantage.

Application forms from Secretary to be returned by 27th July, 1957.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required early August.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 22nd July.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of a REGISTRAR in Ophthalmology for the Aberdeen Royal Infirmary. The post is a whole time one and is non-resident. Salary and conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER (Male) for general medical duties. Post vacant 13th August, 1957.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for Traumatic and Orthopædic Unit. 6 months appointment, suitable for pre-registration candidate.

Applications, stating age, qualifications and experience with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics/gynæcology) required at Ashton-under-Lyne General Hospital. Bed complement 75 obstetric and 26 gynæcology. Recognised for M.R.C.O.G. Vacant end of August, 1957.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN for the Neurological Unit (a part of the Department of Neurology of the United Oxford Hospitals). Vacant 1st August, 1957. Recognised pre-registration post, also open to registered practitioners, in which case status up to Senior House Officer may be awarded.

Applications, with copies of 2 testimonials, to the Administrative Officer.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. PLASTIC SURGERY AND JAW INJURIES UNIT. (NUFFIELD BURNS UNIT.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in the above department of the Hospital. Duties will include care of patients in the Burns Unit (under supervision), and also work in general plastic wards and the theatre.

Applications, with the names of 2 referees, to the Administrative Officer.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEBINGTON, WIRRAL, CHESHIRE. CLATTERBRIDGE HOSPITAL. (819 Beds.) CENTRAL WIRRAL GROUP. JUNIOR HOSPITAL MEDICAL OFFICER (Casualty/Orthopædics) resident, to commence 1st September, 1957. Salary in accordance with current terms and conditions of service, i.e., £852 10s.–£55–£1182 10s. p.a., less £170 p.a. for residential facilities.

Application forms, obtainable from Group Secretary, to be returned by 15th July, 1957.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Resident Pre-registration HOUSE PHYSICIAN required end July.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (436 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second or third post), vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BLACKBURN (near). CALDERSTONES HOSPITAL, WHALLEY, near BLACKBURN, LANCASHIRE. (For Mental Defectives—2378 Beds.) CALDERSTONES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER for holiday relief over approximately 6 months. Salary £19 5s. per week. Residential quarters available. No previous experience of mental diseases or mental deficiency necessary. This post would give valuable experience to practitioners who have the necessary 1 years experience after full registration and who are proposing to take up public health appointments and to study for the D.P.H. or D.P.M.

Applications, stating age, qualifications and experience, together with the names and addresses of 3 referees, to be submitted to the Medical Superintendent, Calderstones Hospital, Whalley, near Blackburn, as soon as possible.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), now vacant. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of casualty by R.C.S. (Eng.). Teaching programme by Consultant staff. 6-month appointment, some of which may be spent in 42-bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator by 23rd July, 1957.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. E.N.T. DEPARTMENT. HOUSE SURGEON (resident), vacant 18th September, 1957. Recognised for D.L.O. Busy Hospital with 780 Beds with approximately 50 E.N.T. beds. Candidates with previous experience in E.N.T. work considered for appointment as Senior House Officer.

Applications, with copies of 2 recent testimonials, to the Group Secretary.

BIRMINGHAM. MOSELEY HALL HOSPITAL FOR CHILDREN, Alcester-road, BIRMINGHAM, 13. (65 Beds.) SENIOR HOUSE OFFICER (pædiatric), vacant 1st September, 1957. Resident/non-resident. Recognised for D.C.H.

Apply, with 3 testimonials, by 17th July to Secretary, Birmingham (Selly Oak) Hospital Management Committee, Oak-Tree-lane, Birmingham, 29.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Group, Dudley Road Hospital, Birmingham, 18**

(*a*) REGISTRAR (E.N.T. surgery) for Birmingham and Midland Ear and Throat Hospital. Resident. Recognised for D.L.O. and F.R.C.S.

(*b*) REGISTRAR (surgical) for Dudley Road Hospital. Considerable experience essential—high qualifications an advantage. Excellent opportunities for wide range of experience.

(2) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (general surgery) for Gulson Hospital, Coventry (312 Beds). Resident. Recognised F.R.C.S. Experience specialty essential. Higher qualification desirable. Vacant 8th September.

(3) **West Bromwich Group, Edward-street, West Bromwich**

REGISTRAR (general surgery) for West Bromwich and District General Hospital. Recognised for F.R.C.S. Duties in Casualty Department. Opportunity deputise for Resident Surgical Officer in general surgery work. Experience specialty required. Resident.

(4) **Mid-Worcestershire Group, Birmingham-road, Bromsgrove**

REGISTRAR (casualty) for Kidderminster and District General Hospital (112 Beds), required also to deputise for Surgical Registrar. Experience specialty essential. Higher qualification desirable. Resident or non-resident.

(5) **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

REGISTRAR (chest diseases) (Salop area). Duties at Chest Clinics (mainly at Shrewsbury and Wellington) and group hospitals (mainly Wellington, Cross Houses and Shirlett Sanatorium). Previous experience essential. Vacant 1st October.

(6) **South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR (obstetrics and gynæcology) required primarily for new Maternity Unit at Warneford Hospital, Leamington Spa (50 maternity, 15 gynæcological beds and Premature Unit). Post vacant 15th August, 1957.

Application forms from Group Secretaries to be returned by 22nd July, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Chest Diseases. Duties alternating between Cheshire Joint Sanatorium, Market Drayton (302 Beds), and City General Hospital and Chest Clinic, Stoke-on-Trent.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 29th July, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD AND UNITED BIRMINGHAM HOSPITALS. Whole-time SENIOR REGISTRAR in Radiodiagnosis. Duties at Coventry and Warwickshire Hospital and other hospitals in the Coventry group (9 notional half-days) and United Birmingham Hospitals (2 notional half-days). D.M.R.D. essential. Non-resident.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned by 29th July, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for Locum appointment of SURGICAL REGISTRAR (Senior Registrar grade) to the United Birmingham Hospitals. The duration of the appointment will be for 1 year only, and will be tenable at the Queen Elizabeth Hospital. Candidates must be registered medical practitioners and should possess the F.R.C.S. They may be required to be resident.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the 2 posts of NON-RESIDENT SENIOR HOUSE OFFICER for duty in the Casualty Department at the General Hospital, Birmingham. The post is tenable for 1 year.

Forms of application may be obtained from, and should be returned as soon as possible to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM (near). MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. HOUSE SURGEON (obstetrics) required. Vacant 1st September, 1957. 121 obstetrics and 10 gynæcological beds. Recognised for Diploma and Obstetric part of M.R.C.O.G. Premature Baby Unit. Hospital affiliated to Birmingham Medical School for training of students.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM (near). THE MIDLAND CENTRE FOR NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. (75 Beds.) SENIOR HOUSE OFFICER. Duties to commence on or about 1st September, 1957. The appointment is for 6 or 12 months and is tenable in medical neurology and neurosurgery.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (Senior House Officer grade). Post vacant beginning of September.

Applications, stating age, qualifications, nationality, and copies of testimonials, to Medical Superintendent.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON (pre-registration). Obstetrics, General Hospital. 5 other resident medical staff.

Apply Medical Superintendent.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENTS' DEPARTMENT, George-road, BIRMINGHAM, 15. SENIOR HOUSE OFFICER or HOUSE OFFICER (resident) required. Modern well-equipped Inpatients Department, providing facilities for study of skin diseases. Required to assist Consultant at out-patients clinics.

Applications, with copies of 2 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIDEFORD AND DISTRICT HOSPITAL, North Devon. (51 Beds.) SENIOR HOUSE OFFICER required for medical and surgical duties from 19th August, 1957. Married accommodation available in the Hospital.

Applications, stating age, qualifications and experience, and naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BISHOP AUCKLAND. THE GENERAL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Vacant 1st September, 1957. Recognised for D.Obst.R.C.O.G. Departmental beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, at above address.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Unit. Salary in accordance with national scale. This post is recognised as a pre-registration appointment.

Applications, stating age, qualifications, and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 2 CASUALTY HOUSE SURGEONS (duties include work in Orthopædic and Traumatic Unit), vacant beginning and end July. Posts recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road. (130 Beds and Cots.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Vacancy for SENIOR HOUSE OFFICER from 21st August, 1957. Salary at the rate of £819 10s. p.a., less £150 p.a. for residential emoluments. Candidates should have had experience in pædiatrics. The post is recognised for D.C.H.

Applications, stating age, nationality, experience, together with copies of 2 testimonials and the names of 2 referees, should reach the Administrative Officer not later than 18th July, 1957.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for the Department of Thoracic Surgery (120 Beds) at Frenchay Hospital.

Apply to Group Secretary, Frenchay Hospital, Bristol, giving age and experience and quoting 2 referees.

BURTON GENERAL HOSPITAL AND ANDRESSEY HOSPITAL, BURTON-ON-TRENT. HOUSE SURGEON (gynæcological and obstetrics) required at above Hospital as from 1st July, 1957. Post recognised for pre-registration purposes.

Apply Group Secretary.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE SURGEON (general—pre-registration) required at the above Hospital as from 1st August, 1957. Post recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURTON-ON-TRENT. GENERAL HOSPITAL. Junior HOSPITAL MEDICAL OFFICER ANÆSTHETIST required at the above Hospital. Flatlet (furnished or unfurnished) available shortly.

Applications to Group Secretary, General Hospital, Burton-on-Trent, as soon as possible.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of a RESIDENT SENIOR HOUSE OFFICER (surgical) for the above Hospital of 334 Beds, including a new Surgical Unit of 56 Beds. The post becomes vacant on 1st September, 1957. There is no emergency surgery undertaken at the moment, but the successful applicant will attend surgical outpatient sessions at the Royal Victoria Hospital, Boscombe.

Applications to the Hospital Secretary, Christchurch, Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds, including 93 medical.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT MEDICAL REGISTRAR at the above Hospital. Candidates must be registered medical practitioners and the possession of a higher qualification will be considered an advantage. The post becomes vacant on 1st October, 1957, and is tenable for 1 year in the first instance.

Forms of application, obtainable from the Group Secretary, Bournemouth and East Dorset Hospital Management Committee, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him duly completed by 17th July, 1957.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The appointment, which is recognised for pre-registration purposes, becomes vacant on 28th August, 1957.

Applications to the Hospital Secretary.

BOURNEMOUTH AND EAST DORSET GROUP OF HOSPITALS. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Anæsthetics for the above Group with duties including the Christchurch Hospital. This is a new post which is consequent upon the opening of 56 surgical beds at Christchurch Hospital. The post is tenable for 1 year in the first instance and applicants should have had considerable experience in anæsthesia. A furnished flat is available on the sea front at Boscombe.

Forms of application are obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, and should be returned to him not later than Wednesday, 17th July, 1957.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Casualty and Orthopædics. This post is recognised for the F.R.C.S.

Full details, including nationality, age, qualifications, and experience, with the names of 2 referees, should be forwarded to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 posts of HOUSE SURGEON at each of the following hospitals :—

LLANDUDNO GENERAL HOSPITAL, LLANDUDNO (recognised for F.R.C.S.).

CAERNARVON AND ANGLESEY GENERAL HOSPITAL, BANGOR (recognised for F.R.C.S.).

The appointments are for a period of 6 months, commencing in July. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of OBSTETRIC HOUSE SURGEON, which is recognised for the M.R.C.O.G. and D.Obst. R.C.O.G., becomes vacant in the middle of August, 1957. National Health Service salary and conditions.

Applications, together with 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., becomes vacant in the middle of August, 1957, National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN becomes vacant early in August, 1957. Salary £745 p.a., with National Health Service conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (may be Locum) required for Accident Unit at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (resident) required for Geriatric Unit (200 Beds) at above Hospital, commencing 1st August, 1957.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Pædiatrics at Llandough Hospital, Penarth. The post is a resident one, commencing 1st October, and provides excellent experience for those entering general practice. Pædiatric experience desirable but not essential.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR HOUSE OFFICER (non-resident) in the Casualty/Orthopædics and Fracture Departments at the Cardiff Royal Infirmary. The successful applicant will spend 8 months of the appointment in the Casualty Department, and 4 months in the Orthopædics and Fracture Departments. To commence mid-September.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR HOUSE OFFICER in General Medicine at Llandough Hospital, Penarth, Glam. Non-resident post, to commence as soon as possible.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARLISLE. CUMBERLAND INFIRMARY. (331 Beds.) SENIOR HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. examination.

Forms of application may be obtained from the Group Secretary, Cumberland Infirmary, Carlisle.

CARLISLE. CUMBERLAND INFIRMARY. (331 Beds.) Applications are invited for the following appointments :—

HOUSE OFFICERS, vacant 1st August, 1957. Recognised for pre-registration purposes :—

3 General Surgery—recognised for F.R.C.S. examination.
1 gynæcology—with some obstetrics.

SENIOR HOUSE OFFICERS, now vacant :—

1 Specials (E.N.T. and eyes).
1 Orthopædics.

Apply to the Group Secretary, Cumberland Infirmary, Carlisle.

CARLISLE. GARLANDS HOSPITAL. GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £819 10s. p.a. Flat is available for which a deduction will be made. Appointment subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience and the names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. Applications are invited for the following resident posts (pre- or post-registration) for the 6 months commencing 1st August, 1957.

HOUSE OFFICER (orthopædic).
HOUSE OFFICER (surgical).

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent, Law Hospital, Carluke.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. SENIOR HOUSE OFFICER (Chest Unit), medical and surgical duties. Vacant 1st August.

Applications, stating age, qualifications and experience, with copies of testimonials and the names of 2 referees, should be sent to the Group Secretary at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (post approved for Pre-registration Service.) General Surgery with duties in genito-urinary. Vacant now.

Applications, giving age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to the Secretary at above address.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House OFFICER (E.N.T. Department) for 6 months from early August. Pre-registration (surgical) or post-registration applications will be considered.

Apply to the Secretary at once stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units. The post is recognised for the D.A. and F.F.A.R.C.S.

Applications, stating age, qualifications, and experience, with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD, ESSEX. BROOMFIELD HOSPITAL. Required, experienced Locum Tenens SENIOR REGISTRAR for 1 year, full residence or only when on duty. Unit has 312 Beds for the treatment of pulmonary tuberculosis in adults. Tuberculous and non-tuberculous thoracic surgery, chest clinics, and mass radiography.

Apply Physician-Superintendent.

CHESTERFIELD ROYAL HOSPITAL. House Officer or SENIOR HOUSE OFFICER required 17th August, 1957, for Casualty Department. Post recognised for the F.R.C.S. and Pre-registration Service.

Please apply, with copies of 2 testimonials, to—

M. H. BOONE, Group Secretary.

CHESTERFIELD ROYAL HOSPITAL. House Surgeon (Senior House Officer of pre-registration House Officer) required urgently. Post recognised for F.R.C.S.

Please apply, with testimonials, to Group Secretary, or telephone Chesterfield 7271 for interview.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester, Essex (185 Beds)

Post of HOUSE OFFICER (surgical). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Black Notley Hospital, Braintree, Essex (516 Beds)

Post of HOUSE SURGEON (first, second, third or pre-registration post). Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S.

Post of HOUSE PHYSICIAN (first, second, third or pre-registration post). Includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CHICHESTER, SUSSEX. ST. RICHARD'S HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN (recognised for pre-registration) for 6 months only in the first instance. Vacant middle of August, 1957.

Applications, stating age, qualifications and experience, and giving names of 2 persons to whom reference may be made, should be sent to the Surgeon-Superintendent.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar), vacant for 1 year in first instance. Hospital recognised for F.R.C.S. Salary £935 first year, less £170 p.a. for residence.

Forms of application from Group Secretary, 174, Broyle-road, Chichester.

CHICHESTER. ST. RICHARD'S AND ROYAL WEST SUSSEX HOSPITALS. Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGY SENIOR HOUSE SURGEON, for 6 months in first instance. Obstetric (16 Beds), St. Richard's Hospital (where resident) and gynæcology at both Hospitals. Occasional relief duties at Maternity Hospital, Rustington (52 Beds). Team of Consultant, Senior Hospital Medical Officer, Registrar and Senior House Surgeon. Salary: £819 10s. p.a., less £150 for residence.

Apply Group Secretary, 174, Broyle-road, Chichester, giving names of 2 referees.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6—Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £819 10s. p.a., less residential charge. Vacant 4th August, 1957.

Applications, stating age, experience, qualifications with references, or names of referees, to Senior Administrative Officer.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds Acute, and Continuation 32 Beds.) SENIOR HOUSE OFFICER (casualty). Modern well-equipped department. Whitley Council salary and conditions of service.

Applications, stating age, qualifications, &c., with names of 2 referees, to be sent as soon as possible to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds Acute, and continuation 32 Beds.) 2 Pre-registration HOUSE OFFICERS (surgical) required. Approved for F.R.C.S. Salary and conditions in accordance with Whitley Council scale. The appointments may be followed by second posts.

Apply immediately, stating age, qualifications, &c., with names of 2 referees, to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

DERBY. CITY HOSPITAL. Derby No. 1 Hospital Management Committee. Applications are invited for the posts of HOUSE SURGEONS (2 vacancies) (pre-registration) or SENIOR HOUSE OFFICER (surgical). Both posts are recognised for the F.R.C.S. and will be vacant 11th September, 1957.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent, City Hospital, Derby, as soon as possible.

DERBY. CITY HOSPITAL. Derby No. 1 Hospital Management Committee. Applications are invited for the posts of HOUSE PHYSICIANS (2 vacancies). 1 vacancy for a Pre-registration or Senior House Officer (medical) 1 vacancy for a Senior House Officer (medical). Both posts will be vacant on 11th September, 1957.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent, City Hospital, Derby, as soon as possible.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE PHYSICIAN (approved pre-registration post). Fully qualified practitioners may apply. Duties include acute and chronic medicine. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, approved for Pre-registration Service. Establishment of 4 House Officers. Post becomes vacant mid-August, 1957, and offers varied experience. National Health Service salary and conditions of service.

Apply to the Secretary, Noble's Isle of Man Hospital, Douglas.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)
SENIOR HOUSE OFFICER (casualty). Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)
HOUSE OFFICER (surgical), pre-registration. Post vacant 20th July, 1957.

Apply, Group Secretary, Guest Hospital, Dudley.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Psychiatry, Suffolk Mental Hospitals, St. Clement's Hospital, Ipswich (440 Beds), and St. Audry's Hospital, Melton, near Woodbridge (1150 Beds), and associated General Hospital outpatient clinics. There is a very active Outpatient Department and Electro-encephalographic Department at St. Clement's Hospital. Trainee post. Both hospitals are recognised for the D.P.M. Married accommodation available.

Applications, stating age, experience and names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 22nd July, 1957. Candidates invited to visit the hospitals by direct arrangement with Medical Superintendent, St. Audry's Hospital.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (anæsthetics) required, resident. Busy General Hospital (421 Beds), easy access to London. Good experience. Application being made for recognition for D.A.

Applications, with copies of recent testimonials, to be sent to the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 17th July.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st September. 12 months appointment. Post recognised in obstetrics by the College for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. Candidates may visit Hospital by appointment with Consultant concerned.

Applications, stating age, qualifications and experience with copies of 3 recent testimonials, should be sent by 28th July to Group Secretary at above address.

EBBW VALE GENERAL HOSPITAL. (General Beds 71—Maternity 15.) Applications are invited for the appointment of a SENIOR HOUSE OFFICER. The Hospital is an active Surgical Unit and the Medical staff consists of a Resident Surgeon and Junior Hospital Medical Officer and visiting Orthopædic, Gynæcological and Ophthalmic Surgeons. The tenure of appointment shall be for a period of 12 months.

Apply, giving full details and references, to Group Secretary, North Monmouthshire Hospital Management Committee, Nevill Hall, Abergavenny, Mon.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. Locum CASUALTY REGISTRAR required at above Hospital from 25th August to 7th September, 1957.

Apply immediately to Medical Director (EDGware 2381).

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital. Post vacant 16th August, 1957, and recognised for F.R.C.S. purposes.

Apply, stating age, nationality, qualifications and experience, together with the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital by 20th July, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT DENTAL HOUSE SURGEON for above Hospital. Post vacant 21st July, 1957. Applicants should have registered dental qualifications. 6 months appointment. Post offers wide experience and is approved for the Dental Fellowship (England and Edinburgh).

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 20th July, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) RESIDENT HOUSE PHYSICIAN for Thoracic and Dermatological Departments. Duties to include "taking of acute general medical cases." 6 months appointment. Post vacant 4th August, 1957.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 20th July, 1957.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (approved pre-registration, first or second post), vacant 16th August, 1957. Duties with General Surgical Unit. Recognised by Royal College of Surgeons. 6 months appointment.

Applications, with the names and addresses of 2 referees, to Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (pre-registration post), vacant 30th September, 1957. Duties with General Surgical Unit, doing some genito-urinary work. Post recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Locum OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR required for general obstetric and gynæcological duties from 15th July to 31st August, and 15th–29th September, 1957. Non-resident appointment but will be required to sleep in when on duty.

Applications, with names and addresses of 2 referees, to Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, ENFIELD, MIDDLESEX. RESIDENT SENIOR HOUSE OFFICER required for general medical and surgical duties; acute general hospital of 61 Beds. Vacant 1st August, 1957. 12 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EXETER (near). EXMINSTER HOSPITAL, Exminster, near EXETER. (1629 mental beds.) JUNIOR HOSPITAL MEDICAL OFFICER required. Previous psychiatric experience advisable but not essential if candidate has good general experience. Salary scale £852 10s.–£55–£1182 10s. Accommodation is available for a single or married officer. Whitley Council terms and conditions of service.

Applications, giving age, nationality, qualifications and experience, with names of 2 referees, to the Group Secretary, Devon Mental Hospital Management Committee, Exminster Hospital, near Exeter, as soon as possible.

GODALMING, SURREY. KING GEORGE V HOSPITAL FOR DISEASES OF THE CHEST. GODALMING, MILFORD AND LIPHOOK GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident). Salary and deduction for board, lodging, &c., in accordance with national scale (£819 10s.). All modern forms of treatment carried out, including major thoracic surgery, a proportion of the beds being set aside for non-tuberculous chest cases, both medical and surgical. The Hospital is associated with a chest clinic.

Apply, giving names of 3 referees, to the Physician-Superintendent not later than 27th July, 1957.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (118 Beds.) RESIDENT HOUSE PHYSICIAN (Senior House Officer or pre-registration Intern). General medical and pædiatric. Post vacant 1st August, 1957.

Applications, with full details and names of 2 referees, to Secretary, 101, Manthorpe-road, Grantham.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. (472 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER. Resident post. Mental and general experience to be gained. Hospital is recognised as a training centre for the D.P.M. examination.

Applications, in writing, to the Physician-Superintendent as soon as possible.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. (134 Beds.) HOUSE PHYSICIAN required, House Officer or Senior House Officer status. Post vacant 5th August, 1957. Post recognised for Pre-registration Service. Membership of a Medical Defence Society is a condition of appointment.

Applications, giving full details with names of 2 referees, to Hospital Secretary.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for the post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female, resident or non-resident). The post offers wide experience and training in all aspects of psychiatry (inpatient and outpatient), and all modern methods of treatment are carried out. Recognised for D.P.M.

Applications, together with the names of 2 referees, should be forwarded as soon as possible to Physician-Superintendent at above address.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL. SENIOR HOUSE OFFICER in Medicine.

Write immediately to the Secretary, Board of Management for Glasgow South-Western Hospitals, 1301, Govan-road, Glasgow, S.W.1, naming 2 referees.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL. SENIOR HOUSE OFFICER in Surgery.

Apply to Secretary, Board of Management for Glasgow South-Western Hospitals, 1301, Govan-road, Glasgow, S.W.1, naming 2 referees, within 2 weeks of the appearance of this advertisement.

GLASGOW. VICTORIA HOSPITALS BOARD OF MANAGEMENT. RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Bellefield Sanatorium, Lanark.

Applications to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1, with names of 2 referees.

GLASGOW. VICTORIA INFIRMARY. Senior House OFFICER (anæsthetics). Non-resident post recognised for F.F.A.R.C.S. and D.A., vacant 1st October, 1957, for 1 year.

Applications, with names of 2 referees, to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. Locum Tenens CASUALTY OFFICER (Junior Hospital Medical Officer) required for period 12th August—1st September (inclusive).

Please apply to the Hospital Secretary.

HEREFORD. GENERAL HOSPITAL. (154 Beds.) HOUSE OFFICER (general surgery) required, pre-registration post. Hospital recognised by R.C.S. Duties include care of general surgical beds and in addition for 3 months of orthopædic beds and for 3 months of E.N.T. beds.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Victoria House, Eign-street, Hereford.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident ANÆSTHETIST (Senior House Officer) required 1st August, 1957. Recognised for D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications, and experience, together with names of 2 referees, to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HUDDERSFIELD. MILL HILL HOSPITAL. (132 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade—£852 10s.–£55–£1182 10s. p.a.), at the above Hospital. The present allocation of beds is 28 for infectious diseases and 104 for geriatric patients.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties on 1st August, 1957. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required, to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD (near). STORTHES HALL HOSPITAL, KIRKBURTON, near HUDDERSFIELD. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital (2737 Beds). Flat available at a reasonable rental. All modern forms of treatment are carried out at the Hospital and there are facilities for studying for the D.P.M. Experience may be gained in attending outpatient clinics. Whitley Council salary scale and conditions of service.

Applications, stating age, experience, &c., and enclosing names and addresses of 2 persons to whom reference can be made, should be sent to the Medical Superintendent as soon as possible.

E. WALSH, Secretary.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (medical). Post recognised for pre-registration purposes. The selected candidate will be required to look after medical and pediatric cases and may be called upon to give emergency anæsthetics. Post vacant end July.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant now. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE SURGEON required. Pre-registration post recognised for F.R.C.S. Modern Theatre. Staff of 4. Post vacant 1st August, 1957.

Apply to Hospital Administrator as soon as possible.

IPSWICH AND EAST SUFFOLK HOSPITAL, Heath ROAD WING, IPSWICH. (280 Beds.) Post of HOUSE SURGEON (pre-registration), to 2 General Surgeons, now vacant. Recognised for R.C.S. examinations.

Applications, with full details and recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Consultant General Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON (pre-registration). Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-ON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of SENIOR HOUSE OFFICER (general surgery) which is available on 1st September, 1957. The post is recognised for F.R.C.S. purposes.

Applications, stating age, qualifications and experience with 2 testimonials, should reach the Physician-Superintendent of the Hospital within 7 days of the appearance of this advertisement.

KIRKCALDY. FORTH PARK MATERNITY HOSPITAL. REGISTRAR required in Obstetrics to commence duties on 1st September, 1957. The successful applicant will be required to assist in the gynæcological work at Kirkcaldy General Hospital. The post is residential and is recognised for training by the Royal College of Obstetricians and Gynæcologists.

Apply, with copies of 3 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications invited for the post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Unfurnished flat available for married applicants; furnished quarters for single persons. Hospital recognised for D.P.M. and facilities granted for attending neighbouring universities. All modern methods of investigation and treatment carried out. Hospital serving N. Lancashire and Lake District. Post for initial period of 4 years, but renewable if services satisfactory.

Apply Medical Superintendent.

LLANDUDNO GENERAL HOSPITAL, Llandudno. Applications are invited for the post of Locum HOUSE SURGEON from 22nd July, 1957, at above Hospital (recognised for F.R.C.S.). Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

LEEDS REGIONAL HOSPITAL BOARD. Senior Regis-TRAR in Dermatology at the Bradford Royal Infirmary (57 dermatological beds), large Outpatient Department, over 4000 new cases annually. Non-resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 18th July, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of REGISTRAR in Pædiatrics at the General Infirmary at Leeds which will shortly become vacant. The appointment will be non-resident and will be for 1 year in the first instance.

Applications, giving age, full details of qualifications and previous posts with dates, together with the names of 3 referees, to be sent not later than 17th July, 1957, to the Sub-Dean, School of Medicine, Leeds, 2.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. RESIDENT RADIOTHERAPY OFFICER (Senior House Officer status), required, for a period of 6 months. The post affords facilities for training for D.M.R.T. Conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Secretary to the Board, as soon as possible.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery (vacant immediately) for a period of 6 months, to be followed, if satisfactory, by a further period of 6 months.

Full particulars should be sent to—

R. W. HOWICK, Group Secretary.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for appointments as HOUSE SURGEONS for 6 months to be followed if satisfactory by appointments as House Physicians for a further 6 months.

Full particulars should be sent to—

R. W. HOWICK, Group Secretary.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for appointment as HOUSE PHYSICIAN for a period of 6 months. Vacant immediately.

Full particulars should be sent to—

R. W. HOWICK, Secretary.

LINCOLN. LAWN HOSPITAL, Union-road. (Mental Hospital for Private and Amenity Bed Patients—100 Beds.) LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER, or SENIOR HOUSE OFFICER (full-time or Locum) required. All modern treatments used at this active Hospital. Pleasant flat available.

Apply to the Medical Superintendent with copies of 3 testimonials.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for appointment as Locum REGISTRAR in Dermatology for the period 23rd September–14th December, 1957.

Apply by 27th July on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LLANELLY HOSPITAL, Llanelly. (164 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, experience and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical). Applications are invited for this pre-registration post which falls vacant 31st August next.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Locum SENIOR SURGICAL REGISTRAR (resident) required for the whole of August.

Apply Medical Director at above Hospital (Luton 3100).

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. SENIOR HOUSE OFFICER for Accident Service, including duties in the Hand Infection Unit, required 1st August, 1957. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary of the above Hospital.

MACCLESFIELD. PARKSIDE MENTAL HOSPITAL. (1650 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatric). Accommodation available for a single person. The appointment in the first place will be for a period of 4 years but reapplication may be made by the successful applicant at the end of this period. Facilities for attending the course for the D.P.M. at Manchester University will be granted and the Hospital is recognised by the Conjoint Board for the purposes of the D.P.M. The Hospital may be visited by appointment.

Applications, with the names of 2 referees, to be sent to the Medical Superintendent, Parkside Hospital, Macclesfield Cheshire, by 20th July, 1957.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £819 10s. a year, less £150 a year for board and lodging. Post vacant now.

Applications to the Administrative Officer at the Hospital.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. Post vacant 1st August, 1957. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £819 10s. a year, less £150 a year for residential emoluments.

Applications to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. Post vacant 17th August, 1957. The Hospital is recognised by the Examining Board for the F.R.C.S. and the D.O. Salary £819 10s. a year, less £150 a year for residential emoluments.

Applications should be forwarded, as soon as possible, to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MIDDLESBROUGH (near). HEMLINGTON HOSPITAL. TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (medical) at the above-named Hospital, which appointment becomes vacant on 1st September, 1957. The Hospital is situated in the country within easy reach of Middlesbrough and good transport arrangements are available. The Medical Unit consists of 60 Beds, 40 of which are acute.

Applications, stating full details and giving names of 2 referees, should be addressed to the Hospital Secretary.

MITCHAM, SURREY. WILSON HOSPITAL, Cranmer-road. RESIDENT SENIOR HOUSE SURGEON (not recognised for F.R.C.S.), vacant 19th August. This post in small but busy general hospital provides good and varied experience in diagnosis, treatment and operative procedure.

Applications, stating age, qualifications and experience and the names of referees, to be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MORECAMBE. QUEEN VICTORIA HOSPITAL. Senior HOUSE OFFICER (obstetrics and gynæcology). Post vacant now.

Applications, with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. RESIDENT SURGICAL OFFICER (Registrar) required. Post vacant. 3-roomed furnished flat available if required. Hospital is part of University Department of Child Health, carries out undergraduate teaching, and is recognised for D.C.H. 160 active surgical beds including all branches except thoracic surgery. Patients admitted from birth to 16 years.

Applications to Group Secretary, together with names of 2 referees, as soon as possible.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Plastic Unit and Regional Burns Unit (45 Beds for severe burns and scalds). Post vacant. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. CRUMPSALL HOSPITAL. Applications are invited for the post of REGISTRAR (or SENIOR HOUSE OFFICER) in the Department of Neurosurgery at the above Hospital. Vacant 28th August, 1957. A new Department, of over 20 Beds, for adult cases is being started and will become a self-contained unit. Facilities will be made available for the successful applicant to gain experience in psychosurgery at neighbouring hospitals, and, if desired, pædiatric surgery.

Applications, with names of 2 referees, by 22nd July, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester.

MANCHESTER, 19. DUCHESS OF YORK HOSPITAL FOR BABIES. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for 12 months. Post is senior of 3. D.C.H. or M.R.C.P. an advantage but not essential. The Hospital is associated with the University Department of Child Health for teaching purposes.

Applications, with full details together with the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to the Department of Psychiatry, to commence as soon as possible. Whole-time resident appointment (Man or Woman), tenable for 6 months, renewable for a second and possibly a third 6 months. Experience in general medicine essential. This is a first training post, and candidates who do not already possess the D.P.M. are expected to read for the D.P.M. (Manch.).

Application form obtainable from the undersigned, to be returned by 27th July, 1957. G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to the Department of Anæsthetics, to commence as soon as possible. Whole-time, resident appointment for 6 months, renewable for a second and possibly a third 6 months.

Application form obtainable from the undersigned, to be returned by 27th July, 1957. G. H. TAYLOR, Secretary.

MANCHESTER VICTORIA MEMORIAL JEWISH HOS-PITAL. (Acute—104 Beds. Non-sectarian.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade). Recognised for F.R.C.S. Vacant 2nd September, 1957.

Applications, with names of 2 referees, by 26th July, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE PHYSICIAN (pædiatrics) required for mid-August. Previous experience essential. There is a Midwifery Unit of 73 Beds and a Pædiatric Unit which includes 10 thoracic surgical beds. Recognised for D.C.H.

Application forms from Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) for 1 year including 4 months casualty duties. The post is recognised for F.R.C.S., and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary, Withington Hospital, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID-CHESHIRE GROUP OF HOSPITALS. ALTRINCHAM GENERAL HOSPITAL AND ANNEXE, near MANCHESTER. (130 Beds. Recognised under F.R.C.S. Regulations.) Applications are invited for the post of SURGICAL REGISTRAR, vacant end of August. This appointment, in a busy general hospital, with duties at other hospitals in the Group, offers excellent opportunities of practical surgical experience to suitably qualified candidates.

Applications, together with 2 recent testimonials, to be sent to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. Senior REGISTRAR in E.N.T. Surgery in the South Manchester Group of hospitals, mainly at Wythenshawe Hospital, the Manchester Ear Hospital, and the Manchester Hearing Aid Clinic. Arrangements may later be made for the person appointed to transfer to the United Manchester Hospitals (Manchester Royal Infirmary, &c.).

Application forms, obtainable from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, should be returned by 29th July, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at Withington Hospital. The Resident Surgical Officer is appointed to 1 or more surgical firms and is responsible for surgical urgencies as part of his duties. Candidates must hold the F.R.C.S.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE, AND ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEES. Applications are invited for the post of REGISTRAR in Pædiatrics which is now vacant. The successful applicant, who may be either resident or non-resident, will have duties in the Neonatal Departments and Children's Units at hospitals in the above Groups, which are recognised for the D.C.H. The person appointed to the post will supervise the work of Senior House Officers in both Groups and assist the Consultant Pædiatrician.

Apply, stating full details of experience and qualifications, together with names of 2 referees, to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at Wythenshawe Hospital. The post will include responsibility for general surgical and gynæcological beds, and is recognised by the Royal College of Surgeons.

Applications, stating age, qualifications, present post, experience and names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICERS (2), general surgery. Resident posts. 1 vacant 14th August, 1957, 1 vacant 1st October, 1957. Both recognised for F.R.C.S.

Applications, together with the names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regis-TRAR PATHOLOGIST (whole-time), Sunderland Group of hospitals—main hospital, Sunderland Royal Infirmary (312 Beds). Post available from 14th September, 1957. Married or single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA OF CUMBERLAND AND NORTH WESTMORLAND. E.N.T. REGISTRAR. Post recognised for F.R.C.S. and D.L.O. Single quarters available at Cumberland Infirmary, Carlisle. Registrar will work under direction of Senior E.N.T. Surgeon at hospitals in Carlisle, West Cumberland and Dumfries.

Applications, stating age, qualifications and experience, together with names of 3 referees, should be sent to the Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

NEWMARKET GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON, vacant 27th July, 1957. Duties include surgical house charge of general surgical and some eye cases. Post resident and available for 6 months, recognised for pre-registration.

Applications, with copies of 3 testimonials, to the Medical Superintendent.

NEWMARKET GENERAL HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN, vacant 28th August, 1957. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident, and tenable for 6 months. Salary in accordance with national scale.

Applications, with 3 recent testimonials, to Medical Superintendent.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 Residents. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department about 1st August, which is under the full-time charge of a Senior Hospital Medical Officer and there are also 2 Senior House Officers. The Department has recently been rebuilt and re-equipped, and all medical and surgical admissions pass through it. Tenable 6 or 12 months at candidate's option. Excellent experience.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOS-PITAL. Applications are invited for the post of HOUSE PHYSICIAN for general medicine and dermatology. This post is recognised as a pre-registration appointment. Vacant 1st August, 1957.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middx, by 19th July, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOS-PITAL. Applications are invited for 2 posts of HOUSE PHYSICIAN to the Radiotherapy Department. These posts are recognised as pre-registration appointments. Vacant 1st August, 1957.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middx, by 19th July, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOS-PITAL. Applications are invited for the post of HOUSE SURGEON to the Gynæcological Department of 25 Beds. This appointment is recognised for the M.R.C.O.G., and may be a pre-registration appointment. Vacant 1st August, 1957.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middx, by 19th July, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOS-PITAL. Applications are invited for the post of HOUSE SURGEON for general surgery. Recognised for the Final F.R.C.S. in General Surgery, and recognised as a pre-registration appointment. Vacant 1st August, 1957.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middx, by 19th July, 1957.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications invited for Whole-time SURGICAL REGISTRAR, required for 1 year in the first instance. Appointment recognised for the Final F.R.C.S. examination. Candidates may visit the Hospital by direct appointment with the Resident Medical Officer.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 20th July, 1957.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration or registered HOUSE SURGEONS required 31st July.

Applications, stating age, qualifications and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. GENERAL HOSPITAL. 2 Senior HOUSE OFFICERS (medical) required; duties to commence end August and mid-September.

Applications, stating age, qualifications and experience, and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (surgery) required; duties to commence about mid-August.

Applications, stating age, qualifications and experience, and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. SENIOR HOUSE OFFICER (medical), required. The successful candidate will, in addition to medical duties, have an opportunity of assisting in the Obstetric Unit. This post will be accepted as a general medical appointment entry to the M.R.C.O.G. examination.

Apply in writing, stating age, qualifications and experience, together with copies of testimonials, to the Hospital Secretary.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN (Male or Female) for Geriatric Department. Post offers good clinical experience and opportunity for higher studies. Hospital may be visited by appointment.

Applications, with copies of 2 recent testimonials, to Physician-Superintendent.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (resident) in Obstetrics and Gynæcology to the High Wycombe/Amersham Group of hospitals. The appointment will be for 1 year and eligible for a second year, subject to satisfactory service.

Application forms, obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, must reach him by 19th July.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time), in Anæsthetics to the hospitals of the High Wycombe Area. Recognised for the F.F.A.R.C.S.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 19th July, 1957.

OXFORD. UNITED OXFORD HOSPITALS. The Radcliffe INFIRMARY. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service from 1st September, 1957. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 22nd July, 1957.

PONTEFRACT. HEADLANDS HOSPITAL. House PHYSICIAN (Senior House Officer grade) required to fill a post at above Hospital. This is a modern Geriatric Unit of 215 Beds.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract.

PLYMOUTH. MOUNT GOLD HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER for the Orthopædic and Fracture Service centring on Mount Gold Orthopædic and associated hospitals. Post recognised by R.C.S. vacancy early in September.

Applications, stating age, qualifications with dates, &c., and with copies of 2 recent testimonials, to be forwarded to the Secretary, Mount Gold Hospital, Plymouth, within 14 days of this advertisement appearing.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. SENIOR HOUSE OFFICER in Anæsthetics, vacant immediately. Recognised for the D.A. and F.F.A.R.C.S.

Applications, giving age, nationality and experience, with names of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

POOLE GENERAL HOSPITAL, Poole, Dorset. (320 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT MEDICAL REGISTRAR. The post which is tenable for 1 year in the first instance becomes available on 1st September, 1957.

Forms of application are obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, and should be returned to him not later than Wednesday, 17th July, 1957.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital

SENIOR HOUSE OFFICER (general medicine and dermatology), vacant 22nd July, 1957.

HOUSE SURGEON (87 surgical beds) (pre-registration), vacant now.

HOUSE PHYSICIAN (78 medical beds) (pre-registration), vacant 30th July, 1957.

Saint Mary's Hospital (130 surgical beds)

HOUSE SURGEONS (pre-registration), vacant 30th July, 1957, 1st August, 1957, and 11th August, 1957 (2).

HOUSE PHYSICIANS (74 medical beds) (pre-registration), vacant 30th July, 1957, 31st July, 1957 (2), and 13th August, 1957.

HOUSE OFFICER (53 pædiatric beds), vacant 15th August, 1957.

Royal Portsmouth Hospital (61 medical beds)

HOUSE PHYSICIANS (pre-registration), vacant now and 10th August, 1957.

HOUSE OFFICER (15 pædiatric beds) (pre-registration), general medical and pædiatric. Vacant 1st August, 1957.

Applications, stating age, experience, and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

Saint Mary's Hospital, Milton-road, Portsmouth.

PRESTON (near), LANCASHIRE. WHITTINGHAM HOSPITAL. SENIOR HOUSE OFFICER. Applications are invited for this post in the largest Mental Hospital in the country, where all modern treatment is undertaken, including electro-encephalography for the area. Facilities will be given for study either for the D.P.M. at Manchester University or for the M.R.C.P. at a large general hospital a few miles away. The Hospital is well situated in a country district with easy access to Preston, Blackpool and Southport. If single, there are comfortable quarters available.

Applications, endorsed "Medical Officer," giving details of experience and names and addresses of 3 referees, to be addressed to the Medical Superintendent, Whittingham Hospital, near Preston, and be received as soon as possible.

RYDE. ROYAL I.W. COUNTY HOSPITAL. Isle of WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER for Pre-registration Service (salary £467 10s.–£577 10s., according to experience) or SENIOR HOUSE OFFICER (salary £819 10s.) required as House Surgeon. Post recognised for F.R.C.S.

Applications, with names of 2 referees, to the Hospital Secretary by 19th July, 1957.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. BIRCH HILL HOSPITAL. Pre-registration HOUSE OFFICER (obstetrics and gynæcology) required. Recognised for the D.Obst.R.C.O.G.

Apply to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE PHYSICIAN required from 24th July, 1957. Open to either pre-registration applicants or to fully qualified practitioners.

Apply immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROMFORD ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit immediately. The service consists of 100 beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required from 30th July, 1957. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROTHERHAM HOSPITAL, Doncaster Gate, Rotherham. (161 Beds. Recognised for training for F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædic and casualty) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd July, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (355 Beds. Recognised for training for F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd July, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for E.N.T. Department, Royal Berkshire Hospital, Reading (40 Beds). Post recognised for D.L.O.

Applications, stating age, nationality, experience and qualifications, together with names of 2 referees, should be sent to Group Secretary, 3, Craven-road, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post, and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Accident and Orthopædic Department. Post vacant 1st August. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners for the resident post of HOUSE SURGEON to the above Department. The appointment which is vacant immediately is for 1 year, with 6 months gynæcology at the Royal Berkshire Hospital, and 6 months in the Maternity Unit at Battle Hospital. Both appointments are recognised for the Diplomas of the Royal College of Obstetricians and Gynæcologists.

Write, stating age and qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary, Royal Berkshire Hospital, Reading.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 19th August, 1957, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration and F.R.C.S.) HOUSE SURGEON (general surgery and gynæcology). Post vacant now.

Apply with 2 copy testimonials to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SCOTLAND. NORTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics on the staffs of the Aberdeen General Hospitals and the Aberdeen Special Hospitals. Candidates preferably should hold a higher qualification in anæsthetics.

Applications, together with the names of 2 referees, should be lodged by 25th July, 1957, with the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointments as REGISTRARS in the following specialties based at the undernoted hospitals. These appointments will be for 1 year in the first instance and will become vacant during the winter 1957/58. Unless otherwise stated the Hospital is situated in or near Glasgow.

Medicine
Western Infirmary—2 vacancies.
Royal Infirmary/Belvidere Hospital—1 vacancy.
Stobhill Hospital—1 vacancy.
Royal Alexandra Infirmary, Paisley—1 vacancy.

Surgery/Orthopædics
Dumfries Royal Infirmary—1 vacancy.

Pathology
Royal Infirmary—1 vacancy.
Southern General Hospital—1 vacancy.

E.N.T. Surgery
Royal Infirmary—1 vacancy.

Ophthalmology
Eye Infirmary—1 vacancy.

Psychiatry
Stobhill Hospital—1 vacancy.
Bellsdyke Mental Hospital, Larbert—1 vacancy.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 3rd August, 1957. Candidates should state, in order of preference, the posts for which they wish to apply.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance.

SENIOR REGISTRAR in Ophthalmology based at the Glasgow Eye Infirmary.

SENIOR REGISTRAR in Ophthalmology for the Professorial Unit at the Western Infirmary, Glasgow.

SENIOR REGISTRAR in Obstetrics and Gynæcology at Redlands Hospital and the Royal Maternity Hospital, Glasgow.

SENIOR REGISTRAR in Radiotherapy based at the Western Infirmary, Glasgow.

REGISTRAR in Pædiatrics based at the Royal Hospital for Sick Children, Glasgow.

REGISTRAR in Pædiatrics based at Stobhill General Hospital, Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 27th July, 1957.

SHEFFIELD. CITY GENERAL HOSPITAL. (652 Beds. Recognised for training for the F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointments for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd July, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. KING EDWARD VII ORTHOPÆDIC HOSPITAL, Rivelin Valley-road. (154 Beds.) SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (resident) at the above Hospital. The post, which is normally held for 1 year in the first instance, will be subject to the terms and conditions of service for hospital medical staff. Salary £819 10s. p.a. Emolument charge £150 p.a.

Applications, with names of 2 referees, to Group Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

Royal Infirmary

(*a*) NON-RESIDENT or RESIDENT CASUALTY REGISTRAR to the Orthopædic and Accident Department. Post vacant 26th August. Post recognised for casualty requirements for the Final F.R.C.S.

Closing date for applications 22nd July.

Royal Hospital

(*b*) SENIOR HOUSE OFFICER in Orthopædics.

Applications to be sent at once.

Applications for the above posts should state age, qualifications and experience, give the names of 3 referees and be sent as follows :—

For post (*a*) : The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

For post (*b*) : The Superintendent, Royal Hospital, West-street, Sheffield, 1.

SHREWSBURY. CROSS HOUSES HOSPITAL. Obstetric HOUSE SURGEON (pre-registration post), vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of HOUSE PHYSICIAN, vacant 11th August. Pre-registration post. Appointment offers considerable experience in general acute medical work.

Applications, with names of 2 referees, to Secretary, by 26th July.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of HOUSE SURGEON, 1 of 2, vacant 11th August. Pre-registration post.

Applications, with names of 2 referees, to Secretary, by 26th July.

SOUTHAMPTON GENERAL HOSPITAL. (474 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time MEDICAL REGISTRAR becoming vacant beginning of October. Post will be tenable for 1 year in the first instance. Candidates may visit the Hospital, if desired, by prior arrangement.

Forms of application, obtainable from the undersigned, should be returned not later than 24th July, 1957.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (274 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required in August. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer grade) for a period from 1st August, 1957, to 31st March, 1958. Extension of appointment if required. Appointment recognised as fulfilling the conditions of the F.F.A.R.C.S. and the D.A.

Applications, stating age, experience, and qualifications, with copies of 2 testimonials, to be sent to the undersigned not later than 17th July, 1957. J. C. FIELD, Secretary.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment in the Brighton and Lewes Group of hospitals, for duties mainly at the Royal Sussex County Hospital, Eastern-road, Brighton, 7. The appointment, which will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance, is recognised for the F.R.C.S.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 20th July, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Pædiatrics to fill a vacancy in the approved trainee establishment at the Tunbridge Wells Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 27th July, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Pathology to fill a vacancy in the approved trainee establishment at the Isle of Thanet Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 27th July, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the South East Kent Group of hospitals for 1 year only as from 1st October, 1957. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 27th July, 1957.

STAINES HOSPITAL. North West Metropolitan Regional HOSPITAL BOARD. GYNÆCOLOGICAL REGISTRAR (resident) required at above Hospital. Unit has 32 Beds.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, London-road, Ashford, Middlesex, by 23rd July, 1957. Hospital may be visited by direct appointment with the Medical Director of Ashford Hospital.

STOCKPORT. CHERRY TREE HOSPITAL. (Isolation —96 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER, vacant 1st August, 1957.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (531 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgery), vacant 5th August, 1957. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road, STOCKTON-ON-TEES. (84 Beds.) CLEVELAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER, the appropriate salary and conditions of service being in accordance with the Ministry of Health Regulations. (Recognised for D.C.H.)

Applications, with copies of 2 recent testimonials, should be forwarded to the undersigned at West Lane Hospital, Middlesbrough, as early as possible. L. BRITTAIN, Group Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar who shares in emergency duties.

Applications, with copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (general surgery) required. Post vacant now, 6 months appointment.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general medicine) with pædiatrics, vacant July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (general medicine) with dermatology, vacant July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. ORTHOPÆDIC HOSPITAL, HARTSHILL, STOKE-ON-TRENT. (78 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post vacant 7th September. Duties also at North Staffordshire Royal Infirmary.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. WHISTON HOSPITAL, PRESCOT. (892 Beds.) (Obstetrical Unit 74 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology) which is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. examinations. Previous obstetrical and gynæcological experience is essential.

Applications, stating age, qualifications, experience and nationality, and giving 2 names for reference, should be forwarded to N. RICHARDS, Group Secretary.

Whiston Hospital, Prescot.

SULLY HOSPITAL, Sully, Glamorgan. Cardiff Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical) required at above Hospital, commencing 1st August, 1957. Experience will be gained in investigation and treatment of chest and heart conditions.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Medical Department of the above Hospital.

Full particulars, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital.

T. E. JONES, Group Secretary.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident or non-resident appointment of SENIOR HOUSE OFFICER in the Department of Diseases of the Chest at the above Hospital. The department consists of 82 Beds and caters for tuberculous and non-tuberculous pulmonary diseases as well as cardiac and surgical conditions. There are 5 weekly thoracic surgery operation and bronchoscopy sessions. Close liaison within the Hospital with the General Medical Unit and other special departments affords excellent experience.

Applications, stating age, qualifications, and experience, should be addressed to the Medical Superintendent of the Hospital. T. E. JONES, Group Secretary.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Pædiatric Unit of the above Hospital.

Applications, giving particulars of age, qualifications, and experience, together with copies of 2 recent testimonials should be sent to the Medical Superintendent of the Hospital.

T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of HOUSE OFFICER in Gynæcological Department at St. Margaret's Hospital, Swindon. Vacant 31st July. Post is tenable for 6 months. Offers good experience and is recognised for the M.R.C.O.G. By arrangement the appointment can be followed by further 6 months post in the Obstetric Department.

Applications to Secretary, 7, Okus-road, Swindon, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the appointment of SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Nuffield Orthopædic Centre (Wingfield Morris Orthopædic Hospital), Oxford, includes large number of industrial injuries. Salary £819 10s. p.a., less charge for residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, Wilts, immediately.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 17th July (pre-registration post).

Applications, stating age, qualifications with dates, with copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. SENIOR HOUSE OFFICER (anæsthetics) required. Post which is tenable for 1 year will be resident.

Applications, with names of 2 referees, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty and orthopædic), vacant now.

Applications, stating age, nationality and qualifications together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TREDEGAR GENERAL HOSPITAL, Monmouthshire. RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required. Surgical Unit under daily supervision of Consultant. Other staff—Junior Hospital Medical Officer. Married quarters.

Apply immediately.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited from registered medical practitioners for post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics (recognised for D.A. and F.F.A.R.C.S.). The post offers wide experience, as large Orthopædic and Thoracic Units are located in the Hospital in addition to the general surgical and gynæcological wards. Appointment may be either resident or non-resident. If resident, a charge at the rate of £170 p.a. will be made.

Address written applications, stating age, nationality, qualifications with dates, experience, details of previous appointments, and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER (or SENIOR HOUSE OFFICER) in Psychiatry. Accommodation (comfortable flat) available.

Address written applications, giving full personal particulars, details of training, experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS required, recognised pre-registration.

Apply, with names of 3 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WARLINGHAM PARK HOSPITAL, Warlingham, Surrey. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Immediate vacancy for Full-time Locum PSYCHIATRIC REGISTRAR.

Applications, stating previous appointments, to the Acting Medical Superintendent, Warlingham Park Hospital.

WELSH REGIONAL HOSPITAL BOARD. Registrar (psychiatry), Morgannwg Hospital, Bridgend (all modern treatments, active outpatient clinics, child guidance clinic and Psychological Department). Within easy reach of University of Wales. Accommodation available. Subject to review annually.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST FIFE HOSPITALS BOARD OF MANAGEMENT. GLENLOMOND HOSPITAL, BY KINROSS. (Tuberculosis—150 Beds.) Applications are invited from suitably qualified medical practitioners for the appointment of REGISTRAR (resident). Salary £935 rising to £1061 10s. p.a., from which a deduction for board and lodging will be made of £170. Married quarters may be provided if required. The person to be appointed will require to take up duty on 1st September, 1957.

Applications, giving names of 3 referees, should be lodged with the Physician-Superintendent, from whom further particulars may be obtained.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required for the above Hospital. The appointment is recognised for F.R.C.S. examinations.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to Group Secretary, Weston-super-Mare Hospital Management Committee.

WOKINGHAM. PINEWOOD HOSPITAL. (230 Beds with a Thoracic Surgical Unit.) MEDICAL REGISTRAR required at above Hospital. Bronchitis Unit and beds for non-tuberculous conditions of the chest. Unfurnished flat available; residential quarters for single man or woman also available.

Application forms from, and returnable to, Secretary, Windsor Hospital Management Committee, Alma-road, Windsor, by 20th July.

WOLVERHAMPTON GROUP. New Cross Hospital. RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required. Geriatric Department of 260 Beds. Consultant Geriatrician recently appointed and active inpatient treatment and outpatient clinics are being started.

Applications to Group Secretary, The Royal Hospital, Wolverhampton.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in General Surgery required for duty at Billinge Hospital, Orrell, near Wigan (375 Beds). Post vacant 15th July, 1957.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in the Department of Pathology, preferably resident. Post vacant 23rd September. The person appointed will work at the main hospital (315 Beds). Work will include all branches of pathology. Post recognised by the Examining Board in England for Diploma in Pathology.

Application forms obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, to be completed and returned as soon as possible.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR to Department of Physical Medicine, to work at main hospital(s) and in peripheral departments. Non-resident. Work includes all branches of physical medicine and the post is recognised by Examining Board in England for Part II of the D.Phys.Med.

Application forms obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, to be completed and returned by 27th July.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 28th August.

Applications, with copies of 2 testimonials, to Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant 16th August.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required, Senior House Officer grade. Department forms part of Accident Service of Windsor Group. Duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female for post vacant 20th August. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. not a pre-registration post. Successful candidate will be resident at the Old Windsor Unit of the Hospital.

Applications, stating age, nationality, qualifications with dates, with copies of recent testimonials or names of 3 referees, to Secretary by 1st August.

WINDYGATES, FIFESHIRE. CAMERON I.D. HOSPITAL (CHEST UNIT). (30 Beds.) RESIDENT HOUSE OFFICER required to take up duties as at 1st August, 1957. The post qualifies for pre-registration. Salary in accordance with national scale.

Apply, with copies of recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WINDYGATES, FIFESHIRE. CAMERON I.D. HOSPITAL. RESIDENT HOUSE PHYSICIAN required for 6 months as from 1st September, 1957. The post is recognised for Pre-registration Service. The Hospital consists of 100 infectious diseases beds and 30 aged sick beds. Salary in accordance with national scale.

Apply, with copies of 2 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WORCESTER (near). POWICK HOSPITAL. Locum SENIOR HOUSE OFFICER required for several months.

Applications, with copies of testimonials, to Medical Superintendent.

WORCESTER ROYAL INFIRMARY. (213 Beds.) House SURGEON (pre-registration or otherwise) required beginning August, for general surgery post at this busy, acute Hospital. The appointment offers wide and varied experience and is recognised for the F.R.C.S. examinations.

Applications to Hospital Secretary.

WORCESTER ROYAL INFIRMARY. House Surgeon (pre-registration or otherwise) required immediately for Orthopædic Department of this busy general hospital of 213 Beds. The appointment offers wide and varied experience.

Applications to Hospital Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in Pathology, vacant from end of September, 1957. This is a Group appointment with duties at the 2 main hospitals; Southlands Hospital (427 Beds) and Worthing Hospital (210 Beds).

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary.

129, Brighton-road, Worthing, Sussex.

WORTHING HOSPITAL, Lyndhurst-road, Worthing. (210 Beds—Acute general.) Required immediately, HOUSE SURGEON.

Applications from either registered medical practitioners or pre-registration candidates, stating age, qualifications, experience, nationality and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary immediately.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1957. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1957. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

U.S.A. CAMBRIDGE, MASSACHUSETTS. Applications are invited for the positions of RESIDENCIES in Anesthesia for a 2-year period beginning 1st July and 1st September, 1957. Salary $1800 first year and $3600 second year and full maintenance. Training in all branches of anesthesia. Affiliation with other hospitals.

Applications, stating age, nationality, qualifications, and experience, together with the names of their referees, should be forwarded to the Director of Anesthesiology, P.O. Box 89, Cambridge, Massachusetts. Travelling expenses to and from the U.S.A. will be paid. Particulars will be sent as soon as application is received. Please enclose recent photograph with application.

ST. JOHN'S, NEWFOUNDLAND, CANADA. GENERAL HOSPITAL. (475 Beds.) Applications are invited for the following posts:—

RESIDENCY in Surgery.
RESIDENCY in Anæsthesia.

The above posts are now vacant. Salary for each post $3200 p.a., less $480 p.a. for board, maintenance, &c.; full teaching programme. The Hospital is fully accredited by the Joint Commission on Hospital Accreditation and is recognised by the Royal College of Physicians and Surgeons of Canada for 1 years training towards certification. Applicants should have completed pre-registration year. Transportation to St. John's will be paid by the Hospital, and on completion of 1 years service, return passage will be provided.

Applications with full details to be forwarded to—

Dr. E. WILSON, Superintendent.
General Hospital, St. John's, Newfoundland, Canada.

Public Appointments

AUSTRALIA. QUEENSLAND. THE ASSOCIATED FRIENDLY SOCIETIES' MEDICAL INSTITUTE AT BUNDABERG, requires services of a MEDICAL OFFICER. Salary £A1000 p.a., plus free residence. Private practice is allowed, which is estimated to be worth an additional £A1500.

Full particulars obtainable from Agent-General for Queensland, 409, Strand, London.

BILSTON BOROUGH COUNCIL. Staffordshire County COUNCIL. Applications are invited for the separate part-time appointments of MEDICAL OFFICER OF HEALTH of the Borough of Bilston, and ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. The appointments together will constitute whole-time, the allocations being 6 half-days and 5 half-days respectively.

The proportionate salary for each appointment is calculated in accordance with the latest agreed scale, and increments will be given for previous service in the same capacity, the ranges being:—

Bilston Borough Council: £1003 12s. 8d.–£30 (4)–£1123 12s. 8d.

County Council: £596 11s. 10d.–£28 8s. 2d. (3)–£31 5s. 0d. (5)–£838 1s. 4d.

A car will be an advantage and an appropriate allowance will be paid. The posts are superannuable, and the successful candidate must pass a medical examination and produce his birth certificate. Applicants must be fully qualified medical practitioners with experience in public health duties, and must hold the Diploma in Public Health or its equivalent. The candidate appointed will be expected to reside in Bilston as regards the County Council duties, act under the direction of the County Medical Officer of Health, and will be required to perform such duties as may from time to time be prescribed. As regards the duties of Medical Officer of Health, he will be subject to the Sanitary Officers (outside London) Regulations, 1935 and 1951, and to the sole control and direction of the Borough Council. The County Council appointment will be subject to 3 calendar months notice in writing on either side.

Forms of application may be obtained from the County Medical Officer, County Buildings, Stafford, and should be returned to him not later than by first post on 27th July, 1957.

A. M. WILLIAMS, Town Clerk, Bilston.
T. H. EVANS, Clerk of the County Council.

CENTRAL ELECTRICITY AUTHORITY. Applications are invited from registered medical practitioners for the superannuable appointment of SENIOR MEDICAL OFFICER on a full-time basis. The appointment, which will involve a certain amount of travelling, will be based on London and the successful candidate will be required to act, when necessary, as Deputy to the Chief Medical Officer. Candidates should preferably not be more than 40 years of age, and previous experience in industry or research work will be of advantage. Salary, provisionally, within the range £2250–£2500 p.a. The successful candidate will be required to become a member of the Central Electricity Authority and Area Boards (Staff) Superannuation Scheme.

Applications, stating age, qualifications, experience, present position and salary to D. MOFFAT, Director of Establishments, Winsley-street, London, W.1, within 21 days from the date of this advertisement. Quote Ref. L./176A.

DERBYSHIRE COUNTY COUNCIL. Applications are invited from Male medical practitioners for the whole-time appointment of SENIOR ASSISTANT MEDICAL OFFICER. Possession of the D.P.H. (or its approved equivalent) is essential and experience in school health and mental deficiency work is advantageous. The work will be largely administrative in connection with the Public Health and School Health Services but other duties may be assigned to the Officer appointed, who will work under the direction of the County Medical Officer. Office accommodation will be provided in the Central Office. The salary is £1210–£55(5)–£50(4)–£1685 p.a., together with a travelling allowance.

Applications should be submitted to the undersigned by 31st July, 1957. Application forms are not provided, but the conditions of service will be supplied on request.

J. B. S. MORGAN, County Medical Officer of Health.
County Offices, St. Mary's Gate, Derby.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Positions vacant. SENIOR ASSISTANT MEDICAL OFFICERS: (*a*) Enniscorthy (Co. Wexford), (*b*) Letterkenny (Co. Donegal) District Mental Hospitals. Inclusive salary for each post £982–£1168 plus emoluments value £168. Higher initial salary in certain cases. Age limits: 30–50 years with extensions in certain cases.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 2nd August, 1957.

FEDERATION OF RHODESIA AND NYASALAND. MINISTRY OF DEFENCE: vacancies, MEDICAL OFFICERS. Applications are invited for appointment as full-time Medical Officers in the Rhodesia and Nyasaland Medical Corps. Successful applicants (age limit 40 years) will be required to attest in and serve as Regular Officers in the Corps. Appointments are in the rank of Captain on scale £1371 p.a. plus 6 annual increments to £1621 p.a. In addition to the foregoing, a professional allowance of £200 p.a. will be paid. A married Officer may also be paid up to a maximum of £240 p.a. Quarters allowance, if Government quarters are not provided. Children's allowances are payable, if applicable. Promotion to higher rank will be in accordance with the requirements of the service. The officers will be on the staff of the Director of Medical Services.

Applications should be addressed to the Federal Military Liaison Officer, Rhodesia House, 429, Strand, London, W.C.2, who will arrange an appointment to discuss the career offered.

HER MAJESTY'S OVERSEAS CIVIL SERVICE. Applications invited from doctors with qualifications registrable in United Kingdom for following posts in Trinidad. D.M.R. or equivalent also required for (*a*).

(*a*) RADIOLOGISTS for radiological diagnosis or therapy, training of students and other specialised duties including consultations. May be required in absence of Senior Radiologist to assume full responsibility. Salary scale £1500–£1600 p.a. In addition £350 p.a. payable in lieu of consulting fees.

(*b*) MEDICAL OFFICERS (Grade C) (Institutions) for general medical, surgical, obstetrical and casualty duties of a Resident Medical Officer in any medical Institution in the Colony. Salary scale £950–£1350 p.a.

Appointments on permanent basis with pension (non-contributory) or on short-term contract with gratuity (taxable) £25 to £37 10s. a quarter; or from National Health Service with retention of superannuation rights up to 6 years plus gratuity (taxable) of 20% of aggregate salary. (Only permanent officers are members of Her Majesty's Overseas Civil Service.) Quarters if available at low rental or allowance in lieu. Free passages on appointment for Officer and family not exceeding 5 persons in all. Leave passages on certain conditions up to 3 adult fares. Income-tax at local rates. Generous leave. Educational facilities.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/38/010).

LINDSEY COUNTY COUNCIL. Health Department. Applications are invited from fully qualified medical Women for the post of ASSISTANT MEDICAL OFFICER for maternity and child welfare for the Scunthorpe area of Lindsey. Salary in accordance with recommendation of the Medical Whitley Council for Health Services regarding salaries of Assistant Medical Officers—i.e., £1050 p.a. rising by 3 annual increments of £50 and 5 annual increments of £55 to a maximum of £1475 p.a.

Further particulars and forms of application obtainable from DR. C. D. CORMAC, P.O. Box No. 26, County Offices, Lincoln, whom applications should reach by 31st July, 1957.

STAFFORDSHIRE COUNTY COUNCIL. Brownhills URBAN DISTRICT COUNCIL. Applications are invited for the separate part-time appointments of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER, and MEDICAL OFFICER OF HEALTH of the Brownhills Urban District. The appointments together will constitute whole-time, the allocations being 8 half-days and 3 half-days, respectively.

The proportionate salary for each appointment is calculated in accordance with the latest agreed scale and increments will be given for previous service in the same capacity, the ranges being:—

County Council: £835 4s. 7d.–£39 15s. 5d.–6d. (3)–£43 15s. (5)–£1173 5s. 11d.

Brownhills U.D.C.: £501 16s. 4d.–£15 (4)–£561 16s. 4d.

A car will be an advantage and an appropriate allowance will be paid. The posts are superannuable and the successful candidate must pass a medical examination and produce his birth certificate. Applicants must be fully qualified medical practitioners, with experience in public health duties, and must hold the Diploma in Public Health or its equivalent. The candidate appointed will, as regards the County Council duties, act under the direction of the County Medical Officer of Health and will be required to perform such duties as may from time to time be prescribed. As regards the duties of Medical Officer of Health, he will be subject to the Sanitary Officers (outside London) Regulations, 1935 and 1951, and to the sole control and direction of the Urban District Council. The County Council appointment will be subject to 3 calendar months notice in writing on either side.

Forms of application may be obtained from the County Medical Officer of Health, County Buildings, Stafford, and should be returned to him not later than by first post on 26th July, 1957.

T. H. EVANS, Clerk of the County Council.
N. WAINE, Clerk of the Brownhills Urban District Council.
County Buildings, Stafford, 4th July, 1957.

Hospital Services: Non-Medical Appointment

BIRMINGHAM. BLOOD TRANSFUSION SERVICE. JUNIOR SCIENTIFIC OFFICER. Minimum qualification B.Sc. in appropriate science subject (physiology, biology, chemistry, bacteriology, &c.). Previous experience with blood-grouping an advantage but not essential. Application for Locum Tenens of 9–12 months considered. Whitley Council pay, &c.

Apply Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, within 14 days of appearance of this advertisement. Further information from Director, Blood Transfusion Service, 15, Ampton-road, Birmingham, 15, by appointment.

General Practice

PERTH, WEST AUSTRALIA, old-established General Practice. Gross takings average £7500. Well-appointed modern Consulting-rooms attached comfortable family residence, valued at £5000. Goodwill £4500. Reasonable offer considered. Sell or lease with view to purchase. Terms available. Scope for major Surgery and Gynæcology.—Reply to Box 222, G.P.O., Fremantle, West Australia.

Miscellaneous

Required for large charitable hospital in East Pakistan, Physician (M.R.C.P.), Surgeon (F.R.C.S.) and Gynæcologist (M.R.C.O.G.). Married couples holding necessary qualifications preferable. Salary Rs. 2000 per month for each appointment.—Apply to Managing Director, KUMUDINI WELFARE TRUST OF BENGAL LIMITED, Narayanganj, East Pakistan.

Canada. Assistant Medical Officer required for 35-bed general hospital of Grenfell Mission, Northern Labrador. Extremely interesting and varied work for a young man. Involves considerable travel by boat and small aircraft. Excellent opportunity for medical experience.—Apply by letter to The Secretary, GRENFELL ASSOCIATION, 66, Victoria-street, London, S.W.1.

Medical Officers required by Falkland Islands Dependencies Survey for tour of 18 or 30 months service in Antarctic bases. Unique opportunity for research on polar physiology. Suitable candidates will be given research training at the Division of Human Physiology, National Institute for Medical Research London. To leave U.K. in October, 1957. Salary £625 a year. Free passages, quarters, messing and canteen stores. Liberal leave on full salary. Candidates must possess qualifications registrable in the United Kingdom.—Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/44020/LD.

H. J. Heinz Company Limited—Food Manufacturers. Applications are invited from Male registered medical practitioners for the post of Medical Officer to the above Company for their factories in Wigan. In addition to an existing factory employing 1850 workers, a new large factory is nearing completion in the same area which will ultimately employ 3000 workers. The new factory has a comprehensive medical department and the candidate appointed will be expected to develop an occupational health service in the area under the general direction of the Principal Medical Officer. Candidates should be aged about 32 and possess a good clinical background, but previous industrial experience is not essential. Commencing salary £1600 p.a. The salary will be based on the B.M.A. scale for "Medical Officer" grade. A car allowance will also be made.—Applications, with full details of qualifications and experience, together with the names of 3 referees, should be sent to the Principal Medical Officer, H. J. HEINZ CO. LTD., London, N.W.10.

Industrial Medical Officer. The Reed Paper Group is about to appoint a full-time Medical Officer.

(1) To advise the Management of its mills and factories in different parts of the country on medical matters and to supervise the setting up of their medical services.

(2) To supervise the working of the medical service at Aylesford, near Maidstone.

He would be stationed in Kent where over half of the 15,000 employees of the Group work. Candidates should be aged 35–45 with several years of experience in industry and with a broad interest in its problems.

Applications in writing, giving qualifications and experience, should be sent to the Group Personnel Officer, ALBERT E. REED & CO. LTD., Larkfield, near Maidstone, Kent.

Locum Tenens required for Works Medical Officer for approximately 6 weeks August/September.—Apply in writing to the Staff Manager, IMPERIAL CHEMICAL INDUSTRIES LIMITED, Metals Division, Kynoch Works, Witton, Birmingham, 6, quoting MED/306/L.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Wanted: British Journal of Urology, vol. 1941 up to and including 1945 complete, vol. 1946 no. 1 and vol. 1947 no. 1.—Write to: MODERNE BOEKHANDEL K. J. BAS N.V. Leidsestraat 70–72, Amsterdam.

History of District Nursing. The Queen's Institute of District Nursing is collecting material for a history about to be written on district nursing, and would be glad to learn of records and historical documents relating to district nursing before 1887 and not connected with the Queen's Institute.—The General Superintendent would be grateful to receive information at the QUEEN'S INSTITUTE OF DISTRICT NURSING, 57, Lower Belgrave-street, London, S.W.1.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Professional, technical and personal typewriting. Duplicating, circularising, &c., efficiently and speedily executed.—"MOWBRAY," 146, Bishopsgate, E.C.2 (BIS. 2545, BAR. 7665).

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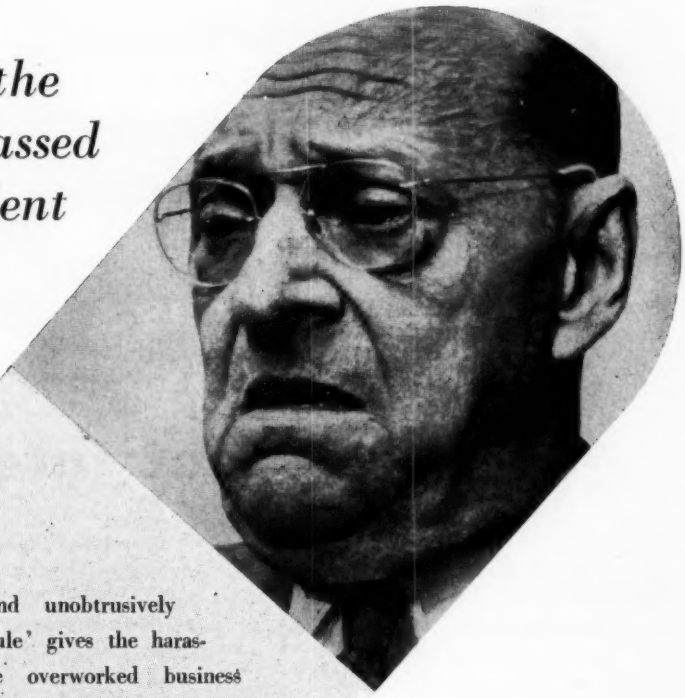
for the harassed patient



Smoothly and unobtrusively 'Drinamyl Spansule' gives the harassed housewife, the overworked business man or the menopausal woman day-long relief from tension—with just one oral dose. 'Drinamyl Spansule' does not tempt the patient to establish the melancholy t.i.d. or q.d. habit of taking 'another pill to keep me going'. Harassment and worry are replaced by a day-long mood of calm composure.

'*Drinamyl Spansule*' sustained release capsules *Strength No. 1:* each capsule contains 10 mg. 'Dexedrine' (dextro-amphetamine sulphate) and 64 mg. (gr. 1) amylobarbitone. *Strength No. 2:* each capsule contains 15 mg. 'Dexedrine' (dextro-amphetamine sulphate) and 97 mg. (gr. 1½) amylobarbitone.

Both strengths in containers of 30 capsules

Drinamyl Spansule

Smith Kline & French Laboratories Ltd.
Coldharbour Lane, London SE5

SUDLP66

three
3
major
drugs

in the treatment of

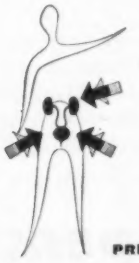
Urinary Tract Infections

Urolucosil
for acute infections

Urolucosil is a highly soluble sulphonamide which is rapidly excreted, largely unchanged, in the urine. It is extremely effective at low dosage levels and free from side effects. Twenty-five tablets, taken over 4-7 days, usually suffice to control an acute infection.

Mandelamine
for chronic infections

Mandelamine is bactericidal and bacteriostatic for a wide range of pathogens, particularly those organisms most often responsible for urinary tract infections. It is non-toxic, virtually free from side effects and eminently safe for prolonged administration. Mandelamine does not give rise to resistant strains.



Pyridium
effective oral analgesic for urogenital pain

Pyridium has a marked analgesic action specifically on the urogenital mucosa. It provides rapid and prolonged relief from pain and symptoms such as dysuria, frequency and strangury. Pyridium is ideal for use in conjunction with Urolucosil, Mandelamine, antibiotics and sulphonamides.

PRESENTATION

Urolucosil *tablets O.1.G. are available in bottles of 25, 250 and 1,000.*

Mandelamine Hafgrams *O.5.G. Bottles of 30, 250 and 500.*

Mandelamine *tablets O.25.G. Bottles of 60, 500 and 1,000.*

Pyridium *tablets O.1.G. are available in bottles of 25 and 500.*

William R. Warner & Co. Ltd., London & Eastleigh.

U.M.P. 170/4